The
CHEMIST AND DRUGGIST

Established 1859 28 Essex Street, Strand, London, W.C.2 *Registered as a Newspaper*

No. 2972
VOL. CXXVI

JANUARY 23, 1937

Annual Subscription (with Diary) 20/-. *Single Copies* 9d.

Index to Advertisers, pp. 5 *&* 6.

MACHINERY NUMBER

FIX YOUR OWN RETAIL PRICE

HAX

ASPIRIN

BRITISH PHARMACOPŒIA STANDARD

Full 5 Grain.

British Made.

In Glass Tubes
With Metal Caps.

CHEAPEST IN ENGLAND

COMPARE THESE PRICES

Contents of Tube.	No. of Tubes per Card.	Per Card.
7 Tablets	3 Doz.	1/6
10 ,,	3 ,,	2/-
12 ,,	2 ,,	1/9
14 ,,	2 ,,	1/11
20 ,,	2 ,,	2/6
25 ,,	1½ ,,	2/3

PLEASE ORDER FROM YOUR WHOLESALE HOUSE

EDWARD HACK LTD., 73 HIGH HOLBORN, LONDON, W.C.1

Carded or Boxed in Dustproof Transparent Outers.

FREE A 6d. IODINE AND STYPTIC PENCIL WITH EVERY CARD OR BOX

A A

CROOKES' *National Press Advertising . . .*

A selection of the media through which Crookes' Halibut Liver Oil will find its way into every house and home in the country. The advertisements themselves are truthful, straightforward and simple and set off by a particularly attractive selection of original drawings by J. H. Dowd.

Crookes' Oil is the only nationally advertised line on a large scale on the CF List.

CROOKES'
PURE HALIBUT LIVER
COLLOSOL **OIL** BRAND (*Regd.*)

THE CROOKES LABORATORIES
(British Colloids Ltd.)
PARK ROYAL, LONDON, N.W.10.
Telephone :- Willesden 6313 (3 lines)
Telegrams :- Collosols, Harles, London.

T.G.S.

INDEX TO ADVERTISERS

(Continued overleaf.

INDEX—cont.

A ROYAL PRINCESS

sponsors this new Beauty Care

H·R·H MARGUERITE

PRINCESS RENÉ DE BOURBON DE PARME

HER ROYAL HIGHNESS is one of the most beautiful Royalties living. Some time ago a face cream was specially created for her and she has now graciously permitted it to be made for sale to the public. This all-purpose cream renews and rejuvenates tired, worn skin; cleanses and protects the skin; refines the pores and makes a perfect powder base.

NEWS THAT MEANS MANY SALES FOR YOU

STRONG SUSTAINED ADVERTISING IN LEADING NEWSPAPERS

Large-space advertisements will appear frequently. They will include a message from the Princess herself.

RADIO ADVERTISING

Programmes will be broadcast from Luxembourg as follows: beginning January 1, every Friday from 12 midnight to 12.30; beginning March 28, every Sunday from 1 to 1.30 p.m.

EFFECTIVE DISPLAYS FOR YOUR WINDOW AND YOUR COUNTER

Beautifully finished portraits of Her Royal Highness have been prepared in sizes to suit your shop, with display stands for jars and tubes of the new cream.

IN JARS TO SELL AT 1/3 AND 6d. IN TUBES TO SELL AT 1/- AND 6d.

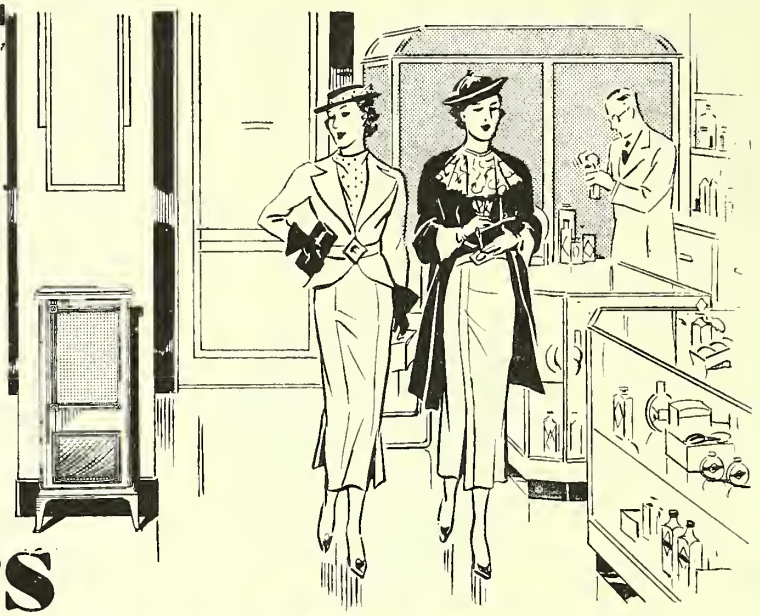
MADE BY
THERON LABORATORIES LTD
PERIVALE, MIDDLESEX

NOTICE TO CHEMISTS

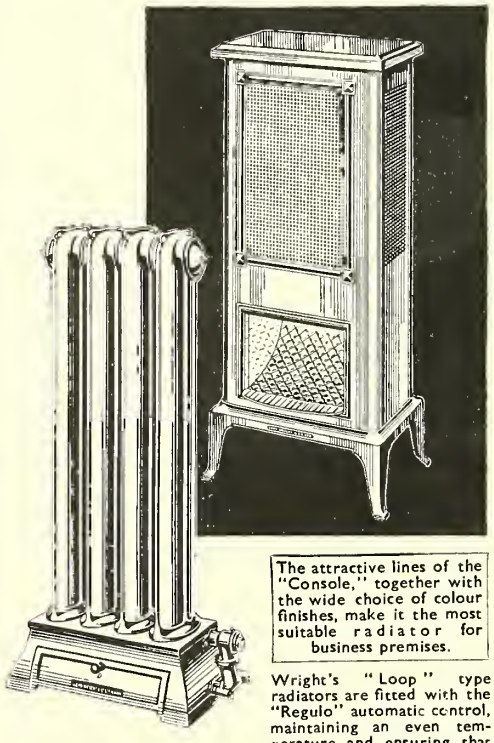
We have sent to chemists, with our compliments, a 1/3 jar and a 6d. tube of this new cream, *absolutely free* If you have not received yours, please let us know and they will be sent. Write to us: Theron Laboratories Ltd., Perivale, Middlesex.

PRINCESS MARGUERITE

All-Purpose CREAM



WRIGHT'S GAS RADIATORS FOR EFFICIENT SHOP HEATING



The attractive lines of the "Console," together with the wide choice of colour finishes, make it the most suitable radiator for business premises.

Wright's "Loop" type radiators are fitted with the "Regulo" automatic control, maintaining an even temperature and ensuring that only a minimum of gas is used

KEEP your premises pleasantly warm. An atmosphere of comfort puts your customer in the right frame of mind for buying and helps your staff to attend to business in a cheerful, contented manner.

One of the outstanding features of Wright's Gas Radiators over all other methods of shop-heating is that these radiators need no attention from the moment they are lighted. Each radiator functions as an independent unit, is easily installed, and can be brought into or put out of commission in a few seconds.

There is no better method of heating pharmacies than Wright's gas radiators.

Illustrated lists will be sent on application to C.D. Dept.

JOHN WRIGHT & CO. LTD.
ASTON, BIRMINGHAM, 6

Radiation

DIXOR BEAUTY PREPARATIONS

Velouty de Dixor

above all other beauty preparations

Offers unique selling opportunities. It is of course the original combined powder cream. You can discuss it interestingly with the customer who is not a regular user; and you can easily persuade her to try it. Once a woman tries Velouty de Dixor she invariably becomes a regular purchaser.

We are advertising Velouty de Dixor extensively in the national papers, and distributing 100,000 "Book of Beauty" Booklets. Show material of Dixor products are available and will gladly be sent on request.

VELOUTY de DIXOR

THE ORIGINAL COMBINED CREAM & POWDER

Made in five shades:
White, Ivory, Natural, Ochre and Soleil Dore (Sungold).

Tubes	*No. 1	4½d.	3/-	per doz.
	*No. 2	6d.	4/-	,,
	No. 3	1/-	7/-	,,
	No. 4	2/-	14/-	,,
	No. 5	3/-	22/-	,,
Pots	Handbag (unbreakable)	1/3	10/-	,,
	Glass	2/9	21/-	,,
	De Luxe (unbreakable)	4/6	36/-	,,

IRADIUM de DIXOR

SKIN TONIC

Bottles	Handbag Size	1/-	8/-	per doz.
	Small	2/6	18/-	,,
	Large	5/6	39/-	,,

EAU DIXOR

A liquid depilatory, for use on the arms and legs

Bottles	Small	1/-	8/-	per doz.
	Large	3/6	27/-	,,

DIXOR DAY CREAM

(CRÉME DIXOR)

A foundation cream made in White only

*Tubes**	Small	6d.	3/-	per doz.
	Medium	1/-	7/-	,,
	Large	2/-	14/-	,,
	Super	3/-	22/-	,,
Pots	Glass	2/9	21/-	,,
	De Luxe (unbreakable)	4/6	36/-	,,

DIXODOR

THE DIXOR DEODORANT

Bottles ... ... 1/- ... 8/- per doz.

CLEANSING COLD CREAM

6 oz. Opal pots **2/9** each (Wholesale price **21/-** doz.)

NOURISHING SKIN FOOD

RESTORES ANY DEFICIENCY OF NATURAL SKIN OILS

4 oz. Opal pots **2/9** each (Wholesale price **21/-** doz.)

* Not less than 1 doz. of each shade supplied.

Minimum Retail and Wholesale Prices P.A.T.A

DIXOR LTD. ST. LEONARD'S WORKS MORTLAKE, S.W.14

ANNOUNCING —

A NEW INEXPENSIVE

'DAWN' FACE CLOTH

IN

ASSORTED COLOURS

Each carton contains 2 doz. and is fitted with a cellophane lid to ensure protection of contents during display.

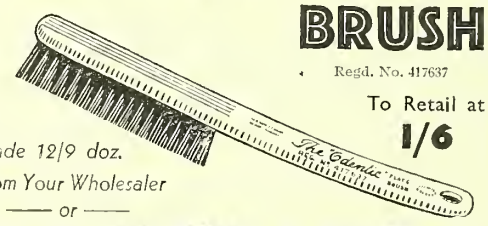
Obtainable from your usual wholesaler.

Jacquesil Fabrics Ltd

105/107 Princess St., MANCHESTER

London Agent: G. H. Bolton, 28 Falcon Square, Aldersgate St., E.C.1

"ODENTIC" PLATE BRUSH



Regd. No. 417637

To Retail at **1/6**

Trade 12/9 doz.

From Your Wholesaler

— or —

W. R. SPEER & SON,

215 Dalston Lane, London, E.8 (EST. 100 YEARS)

'Navy' Blue Blade

New process surgical **BLUE** steel blade suitable for all safety razors.

To retail at 5 for 1/-

Trade Discount 40% less 2½% monthly accounts.

NAVY BLUE BLADE Co. Condor House

14 ST. PAUL'S CHURCHYARD · E·C·4

TELEPHONE · CITY · 7388

Streptocide

(p-*Aminobenzenesulphonamide Evans*)

For oral administration in
Hæmolytic Streptococcal Infections

Work which has been done on the "sulphonamide" derivatives indicates :—

(*a*) That Streptocide has a bacteriostatic and bactericidal action against hæmolytic streptococci in culture medium and in blood; when administered to man and animals their blood is bactericidal to hæmolytic streptococci.

(*b*) That all sulphonamide compounds of similar type are converted into *p*-aminobenzenesulphonamide in the body before they become therapeutically effective. The use of Streptocide therefore ensures prompt action.

Although the official trials now being carried out are not yet completed, there is sufficient evidence to warrant the administration of Streptocide in acute puerperal sepsis, erysipelas, tonsilitis and the sequelæ of these conditions when the presence of hæmolytic streptococci has been confirmed.

Streptocide is likely to be of service also as a prophylactic measure to minimise the risk of puerperal septicæmia in cæsarean section and abortion, for the prevention of complications attributable to hæmolytic streptococci (such as otitis media, mastoiditis, arthritis and endocarditis) in scarlet fever, tonsilitis, rheumatic fever and measles, and to diminish the risk of infection in tonsillectomy.

DOSE:—4 to 6 tablets thrice daily, reduced after clinical improvement is shown. As a prophylactic: 2 to 3 tablets twice or thrice daily. A leaflet dealing more fully with the suggested dosage will be sent on application.

Streptocide is issued in the form of compressed tablets each containing **0·25** grm.

In bottles of 25, **4/-**; 100, **13/6**; 250, **32/6**.
Subject to the usual discounts

Made in England at

EVANS' BIOLOGICAL INSTITUTE

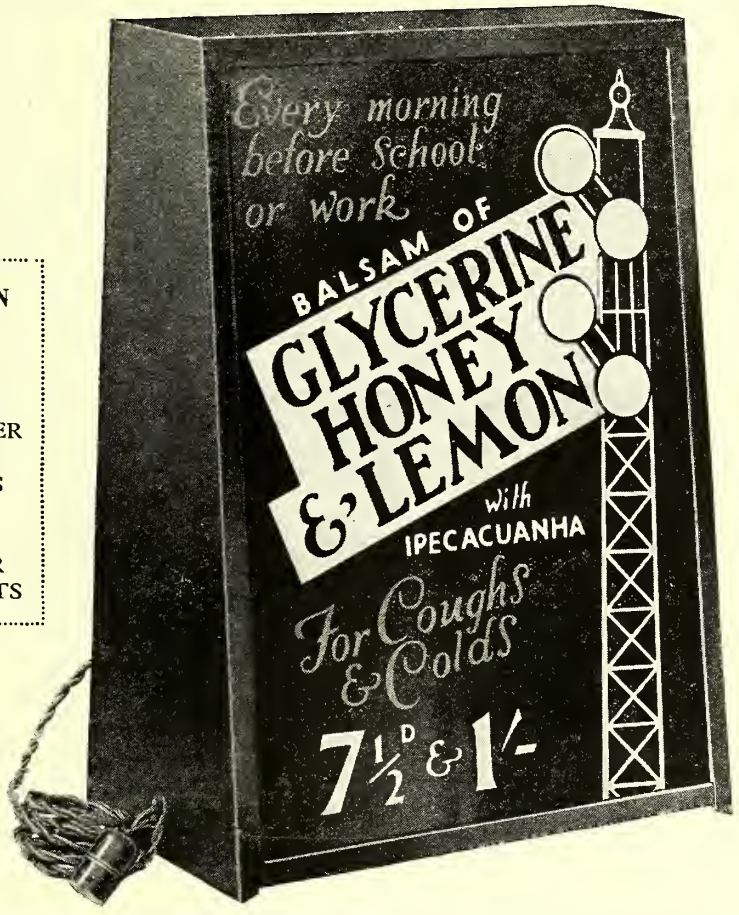
by

Evans Sons Lescher & Webb Ltd.

LIVERPOOL & LONDON

NOW IS THE TIME TO PUT THIS IN YOUR WINDOW

FLASHING SIGN FREE
FOR
THREE GROSS LOTS OF EITHER PRODUCT DELIVERED AS REQUIRED
OR
ON LOAN FOR ONE GROSS LOTS



OWN NAME
ON THREE DOZEN LOTS INTERCHANGEABLE SCREENS WITH SIX DOZEN LOTS OF EITHER PRODUCT EXCEPT No. 3

BALSAM OF GLYCERINE, HONEY AND LEMON WITH IPECACUANHA

	1 doz.	6 doz.	1 gross	3 gross	5 gross
Retail 7½d. (4-oz.)	5/-	4/10	4/8	4/6	4/5
„ 1/- (8-oz.)	8/-	7/9	7/6	7/3	7/-

BRONCHIAL EMULSION

Retail 10½d. (4 oz.)	6/6	6/3	6/-	5/6	5/3
„ 1/6 (8-oz.)	10/6	10/3	10/-	9/3	9/-
„ 2/6 (16-oz.)	18/-	17/6	17/-	16/-	15/6

BRONCHIAL COUGH MIXTURE

Retail 6d. (2½-oz.)	4/-	3/10	3/8	3/6	3/5
„ 9d. (5-oz.)	6/-	5/10	5/8	5/6	5/5

ADULTONIC

	1 doz.	3 doz.	6 doz.	1 gross
Retail 1/6 (suggested) (4-oz.)	9/-	8/9	8/6	8/3
„ 2/6 (suggested) (8-oz.)	15/-	14/9	14/6	14/-

Samples of any of these products free to trading chemists on request.

AYRTONS :: :: :: :: :: LIVERPOOL

Introducing

A New Pack

of the well-tried national favourite

A new jar of Erasmic Vanishing Cream in opal glass to retail at 6d

To meet the widespread demands of both trade and the public for a larger version of the ever popular 3d handbag case of Erasmic Vanishing Cream we have produced

THIS DELIGHTFULLY MODERN PACK IN OPAL GLASS

which will considerably extend your sales of this profitable and popular cream. The new pack will show the same handsome margin of profit as the handbag size — 33⅓% on small parcels. The market for this new pack will be opened out by a separate advertising campaign.

This campaign will appear in special media appealing to women, and strengthened further by being closely linked with the general Erasmic National Advertising.

DISPLAY **Erasmic vanishing cream**

ERV 1-29-100

THE ERASMIC CO. LTD., WARRINGTON

You, as a retailer, are not getting full advertising support unless your lines are advertised in the 'RADIO TIMES'

THE 'RADIO TIMES' LIST FOR YOUR TRADE

The following products are regularly advertised in the 'Radio Times' and are therefore assured of a steady demand. The second half of this list will appear in the next 'Radio Times' advertisement published in this journal.

Gibbs Dentifrice
Silf
Gibbs Shoving Creom
Dettal
Germolene
Izal
Halex Brushes
Cicfa
Erasmic Shaving Stick
Lux Toilet Soap
Craakes Halibut Liver Oil
Kolzona
Pears Galden Glory Soop
Polmalive
Jacigares
Slaans Liniment
Andrews Liver Salts
Parmint Syrup
Kormoid Tablets
Solfoin
Do-Da Asthma Tablets
Carters Little Liver Pills
Mothoks
Allcock Porous Plosters
New Era Treatment

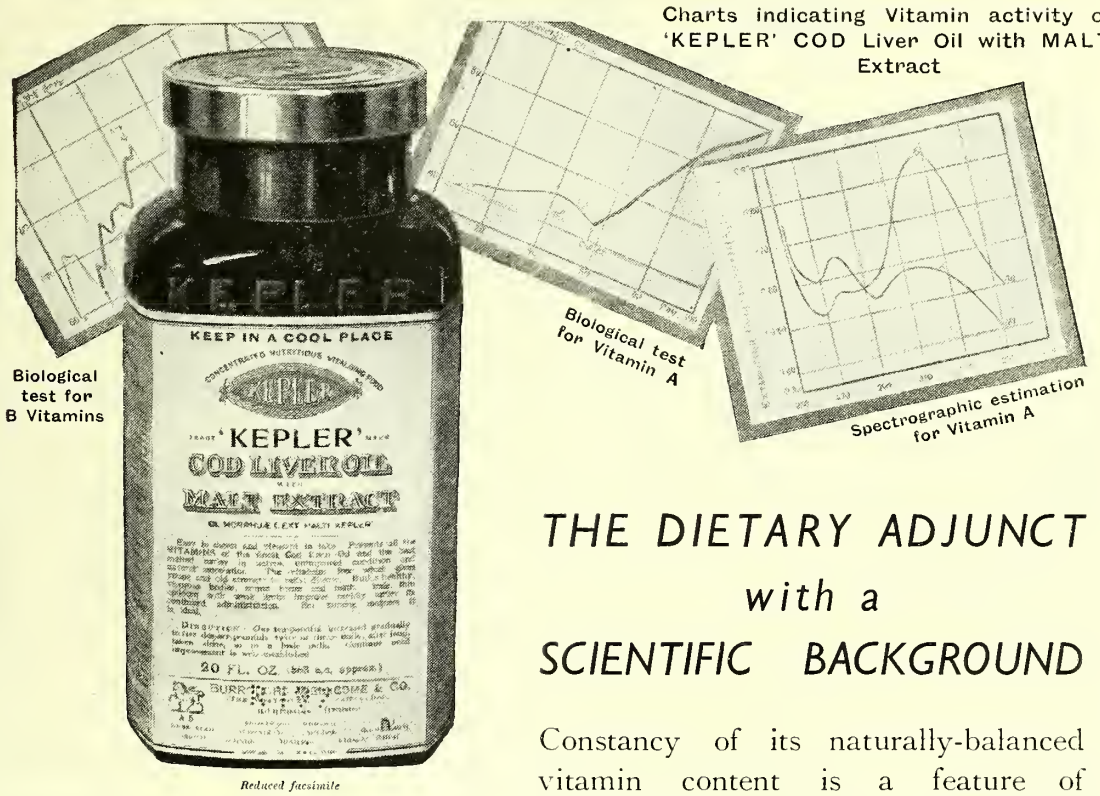
Comedians . . . famous dance bands . . . broadcasts from the ringside of World Championships . . . 2,800,000 people turn the pages of the 'Radio Times' during the week, looking up these items. And they see certain lines advertised. *But are they the lines you are stocking?*

Next time the traveller calls, ask him "Is your line advertised regularly in the 'Radio Times'?" If it isn't, then he's not offering the most powerful co-operation his firm can give you. Make a point of asking the traveller "*Is your line advertised regularly in the 'Radio Times'?*"

TELL THE TRAVELLERS YOU WANT THE

'RADIO TIMES'

NET SALES **2,800,000** WEEKLY



Reduced facsimile

24/6 and 43/6

per doz. bottles

London Prices to the Trade (Subject)

Display material on request

THE DIETARY ADJUNCT with a SCIENTIFIC BACKGROUND

Constancy of its naturally-balanced vitamin content is a feature of 'KEPLER' COD Liver Oil with MALT Extract.

Its Vitamin A content is estimated by the spectrographic method. Results are confirmed by biological tests. Vitamin D content is proved in accordance with the method of the Medical Research Council. The B Vitamins are invariably present in the malt constituent.

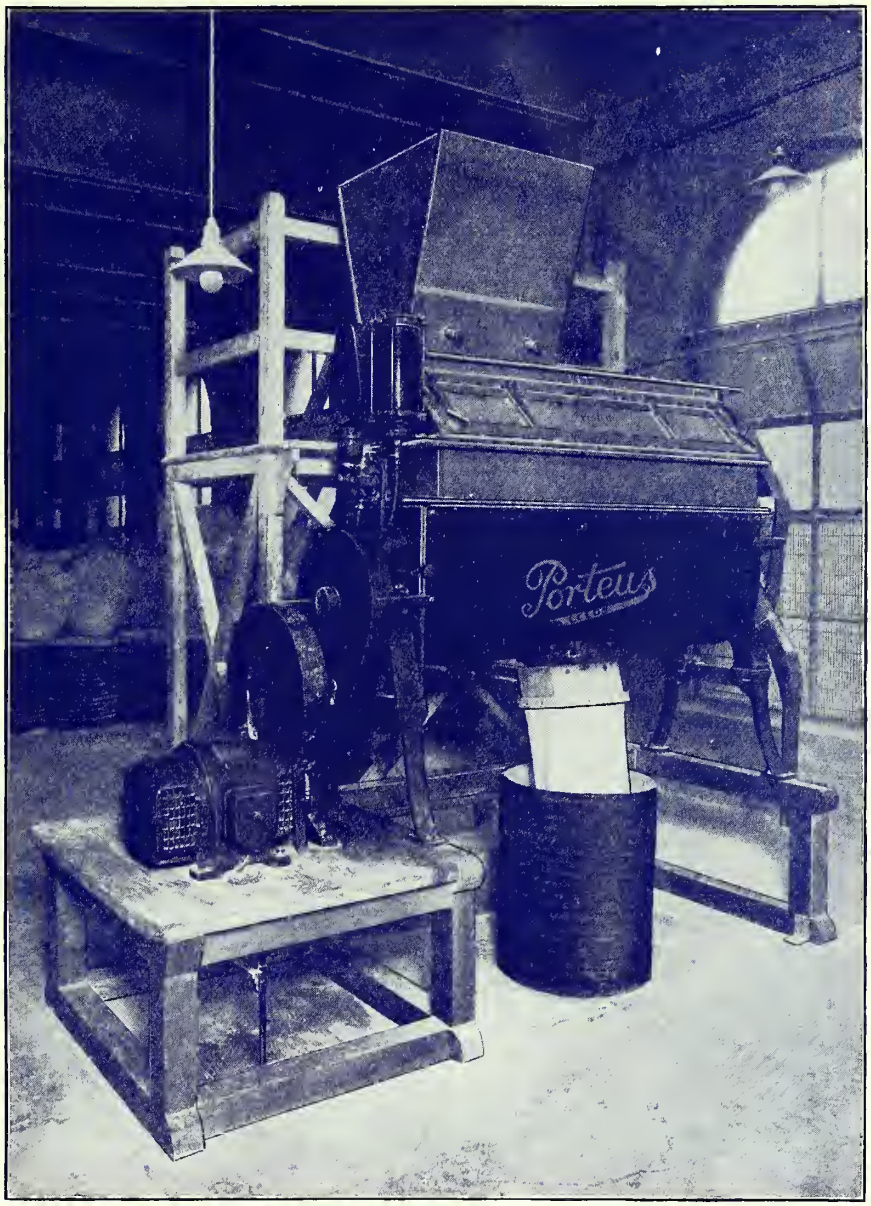
TRADE 'KEPLER' MARK

COD Liver Oil with MALT Extract

BURROUGHS WELLCOME & CO., LONDON

G 1978

'ATLAS' MIXERS AND SIFTERS



★ A new sifter and mixer with patent automatic spraying attachment recently installed in a large manufactory in Yorkshire. A special measuring device ensures exact amount of perfume in each mixing.

We specialise in Automatic Spraying and Grinding Plant, and our Mixing Machines now have a unique new interior construction.

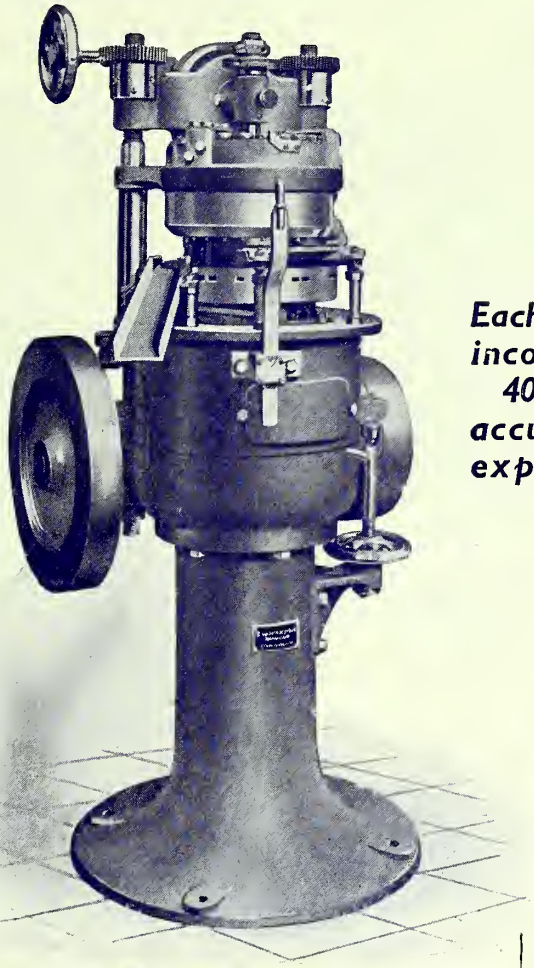
We make every type of machine and invite your enquiries. We will gladly advise on any problem.

Geo. Porteus & Sons (LEEDS) Ltd.

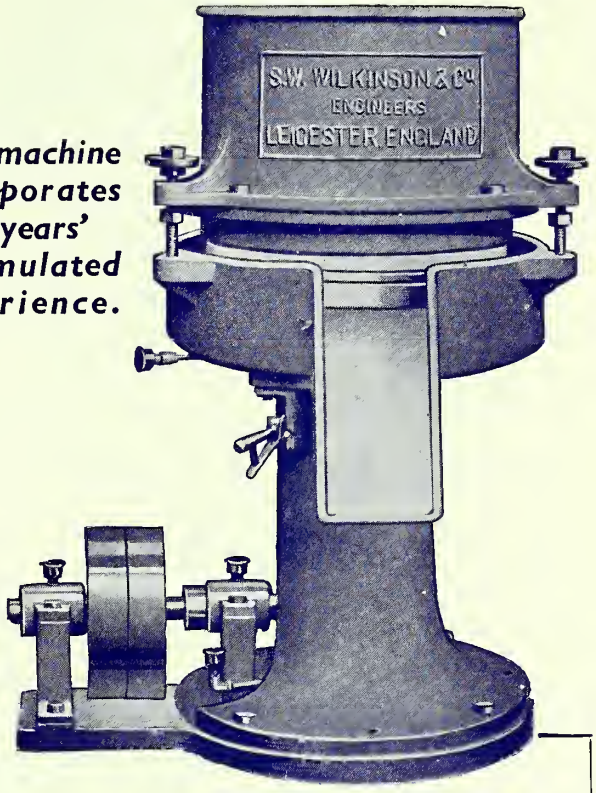
Chemical and Pharmaceutical Engineers

LEEDS BRIDGE, LEEDS. 'PHONE : LEEDS 20529 & 20520

B B



Each machine incorporates 40 years' accumulated experience.



TABLET MACHINES

of both Rotary and Single Punch types

Tablets from $\frac{1}{8}$" to 3" diameter. Special Rotaries for light difficult powders.

Punches and dies manufactured for all makes of machines.

SUPER SPEEDY MILL

In regular use all over the world

This Machine is a combined Mixer and Grinder and is used very successfully in the production of all kinds of Ointment, Tooth Paste, Beauty Cream, Patent Foods, etc.

GRANULATING MACHINES, COPPER PANS, CAPSULE PLANT, CONDENSERS, STILLS, ETC.

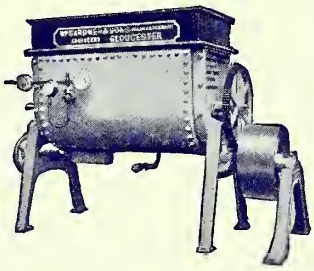
S. W. WILKINSON & CO.

SPECIALISTS IN PHARMACEUTICAL AND CHEMICAL MACHINERY

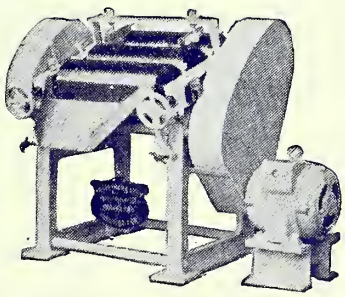
WESTERN ROAD, LEICESTER

FOR COINING MONEY

*The new Gardner **streamlined** combined "Rapid" Sifter and Mixer. All enclosed, but easily accessible. No dirt collecting crevices, etc.*



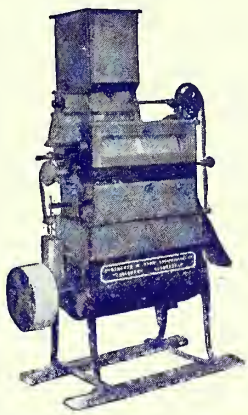
Gardner's patent "Rapid" Dryer (for steam, gas or electric heating); no danger of scorched powders.



Gardner's Triple Roll Mill for lipstick, dental and cosmetic creams, pastes, etc.

Gardner machinery has been coining money throughout the world for the past 75 years. Machines which we supplied 30 years ago are still working and profit-making.

Modern Gardner machines for the chemical and pharmaceutical trades embody all that was best—sturdy construction, long life—and so on—in these old machines allied with improvements arising from our long experience, modern scientific research and engineering practice.



Gardner's patent combined Fine Powder Dresser, Spray Blending Plant and Mixer.

rams: "Gardner, Gloucester." **LONDON:** 19 Gray's Inn Chambers, 20 High Holborn, W.C. 1. *Phone: Chancery 7347.*

The CHEMIST AND DRUGGIST

The Business Newspaper for all Sections of the Drug, Pharmaceutical, Chemical, Cosmetic, Perfumery and Associated Industries

The official organ of The Pharmaceutical Society of Ireland, The Pharmaceutical Society of Northern Ireland, The Chemists' and Druggists' Society of Ireland, and of other Chemists' Societies in Overseas Dominions

Published Weekly at

28 ESSEX STREET, STRAND, LONDON, W.C.2

Telegrams : "Chemicus, Estrand, London" *Telephone : Central 6565 (10 lines)*

BRANCH OFFICES

4 CANNON STREET, MANCHESTER (TEL.: BLACKFRIARS 3052)
54 FOSTER'S BUILDINGS, HIGH STREET, SHEFFIELD (TEL.: 22458)
19 WATERLOO STREET, GLASGOW (TEL.: CENTRAL 2329)
111 NEW STREET, BIRMINGHAM (TEL.: MIDLAND 2921)
19 QUEEN STREET, MELBOURNE, C.1, AUSTRALIA
55a SHORTLAND STREET, AUCKLAND, NEW ZEALAND
155 AVENUE DE WAGRAM, PARIS, XVII[e] (TEL.: ETOILE 19-79)
PLANTAGE FRANSCHELAAN 32 AMSTERDAM-C, HOLLAND

VOL. 126. NO. 2972 JANUARY 23, 1937

CONTENTS

News of the Week

Key Industry Duty Exemption

The Treasury have made an Order under Section 10 (5) of the Finance Act, 1926, exempting N-(OXY-ACETO-MERCURIC-PROPYL)-ETHYL-URETHANE from Key Industry Duty from January 23, 1937, until December 31, 1937.

Medicine Stamp Duties Select Committee

We understand that the meeting of the Select Committee on Medicine Stamp Duties arranged for January 21 is postponed to January 26, influenza being given as the cause. It is expected that the taking of evidence will be concluded at the following sitting, arranged for January 28.

Customs and Excise Import and Export List

A revised issue of this official publication is now available, price 9d., from H.M. Stationery Office, Kingsway, London, W.C.2. Instructions are given as to the correct method of entering goods for clearance through Customs, together with detailed classification by groups of all descriptions of raw materials, food, drink, etc., articles mainly unmanufactured and articles wholly or mainly manufactured.

Sessional Events

A meeting of the Bath Branch of the Pharmaceutical Society was held on January 5, when a special committee was appointed to make preliminary arrangements for the visit of the British Pharmaceutical Conference. Mr. P. J. Williams, B.Sc., was elected *President*, Mr. Luther Wilson *Vice-President*, and Mr. W. J. Hallett *Secretary*. The proposed branch federation scheme was also discussed, but action on the part of the Branch was deferred.

A New Year's Eve dance organised by the Portsmouth ladies' committee, under the presidency of Mrs. W. R. Atterbury, was held at the Queen's Hotel, Southsea. Dancing was kept up until 1 a.m. During an interval Mr. W. L. B. Murray asked Mrs. Atterbury to distribute the prizes won during the evening, and Mrs. Atterbury received a bouquet of flowers and a box of chocolates from the gentlemen. Mr. T. A. Johnson acted as M.C.

Colour photography as popular with the ordinary snap-shotter as black and white photography is to-day was predicted by Mr. J. Mitchell (Ilford, Ltd.), when lecturing a meeting of Bolton chemists and photographic dealers recently. Mr. F. Brindle, Ph.C., presided. A cine film in colour was shown. Moving a vote of thanks to the lecturer, Mr. J. H. Walmsley said it was gratifying to dealers to know that these films were being put into the hands of the public at such reasonable prices. The public were showing an interest in colour photography, and it was up to dealers to encourage that interest. Supporting, Mr. V. Slater said he could speak very highly of the Dufay colour process from his own experience.

Birmingham

Mr. J. L. Phillips, who has been appointed representative of S. Maw, Son & Sons, Ltd., for a special area in the Midlands, has had twenty-three years' experience with the House of Maw, including two years on London representative work.

Birmingham

A meeting of Birmingham and District chemists was held at the Grand Hotel on January 12, Mr. F. W. Yeomans in the chair. The speaker was Mr. G. A. Mallinson (secretary of the National Pharmaceutical Union), whose subject was "Matters of Moment Affecting Pharmacists." Mr. Mallinson first referred to education, which, he said, was a matter for the Pharmaceutical Society. The Poisons Rules were not very popular, though he felt the safeguards provided by law were more valuable than was generally realised; one point secured was that the sale of a large number of preparations containing only comparatively small amounts of poison was definitely restricted to chemists. He reminded chemists of their obligation to bring all poisons labels up to date, and recommended anyone in doubt to submit labels to the Union for advice. Mr. Mallinson referred to four schemes for amalgamations of retail establishments; he was confident that the private chemists would always hold their own against company concerns. The Shops (Sunday Trading Restriction) Act provided for the restriction of sales of medicines and surgical appliances to retail chemists. A clear exemption for pharmaceutical labour was at first obtained, but this was later revised at the request of the Pharmaceutical Society in the interests of their members, who were qualified assistants. At the medicine-stamp duties inquiry he thought that all the bodies representing pharmacy had ably stated the chemists' case.

In view of the position in regard to medicine-stamp duty the Chemists' Friends scheme was all the more vital to the protection of the chemists' business. The results of the first twelve months had proved very satisfactory, and at the first annual meeting of manufacturers in the scheme they all expressed satisfaction. This scheme was the most important development in the trade since the inauguration of the Proprietary Articles Trade Association. Mr. Mallinson reported a consulting accountant's inquiry into three sets of businesses supporting the Chemists' Friends scheme absolutely, one of three shops, one of four shops, and one of six shops. The report over twelve months was turnover satisfactory, profit increased, the Chemists' Friends scheme had been adhered to in each case and the amount of window display bonuses as distinct from quantity terms was £6 in every £1,000 turnover. Mr. Mallinson appealed for increased support from chemists in the Birmingham area.

Mr. Roach asked if the embargo could with advantage be removed from drug stores. The reply was that there was nothing to prevent a drug store from being turned into a limited company with a chemist on the directorate, but that the embargo on drug stores must remain. Mr. Bodley spoke of leakage of Chemists' Friends goods through institutions. Mr. Izon viewed with apprehension the tendency towards amalgamation of wholesalers. Further questions were put by Messrs. Shelley, Southerton, Gardner and Williamson, to which Mr. Mallinson suitably replied.

Bradford

Bradford District Branch of the Pharmaceutical Society met at the Midland Hotel on January 5, when Dr. H. Park Shackleton (president, Yorkshire Magical Society) spoke on "Magic—Ancient and Modern," with practical demonstrations. An influenza epidemic in the district affected the attendance.

At Bradford Quarter Sessions, on January 13, Alfred Cecil Yorke (34), Eccles, described as a manufacturing druggist, with business premises at Station Road, Pendlebury, was found "Guilty" on three charges of receiving stolen goods. He was bound over for two years, and was ordered to pay £50 towards the costs of the prosecution. The goods, valued at £121, were the property of Brook, Parker & Co., Ltd., manufacturing chemists, Ashfield, Bradford.

Derby

The seventh annual staff dinner and dance for the staff of the St. Peter's Street, Derby, branch of Boots, Ltd., was held in the Assembly Rooms, Derby, on January 13. Mr. L. Stobart (manager) presided.

Mr. F. W. Weaver, sales director of F. W. Hampshire & Co., Ltd., Derby, has retired after twenty-nine years' service. Mr. Weaver joined the company as a traveller, then became factory manager and general manager. Suitable presentations were made.

Leeds

A meeting of the Leeds Branch of the National Pharmaceutical Union was held on January 12, Mr. F. C. Stock in the chair. At the commencement of the meeting the chairman asked the members to stand in silence in memory of Mr. Herbert Gilleghan. Mr. E. Buckley gave "A Talk on N.H.I. Contracts." Replying to Mr. Carr, he explained that the present contract was made for five years. Mr. N. H. Burns spoke on "What is Wrong with Pharmacy?" Mr. Burns said there was a lack of loyalty in the ranks. The C.F. scheme has not been given the support it should have had, partly because of the lack of publicity during the summer months. Too small a value was placed by the pharmacist on his qualification. Mr. J. H. Gough, in presenting "A Few Unusual Incompatibilities," showed samples to illustrate his talk. A vote of thanks to the speakers was proposed by Mr. N. N. Armitage.

A special meeting of the Leeds and District Branch of the Pharmaceutical Society was held at the Hotel Metropole on January 14, Mr. W. Eaddie in the chair. The meeting passed a resolution of condolence with the relatives of the late Mr. Herbert Gilleghan. The secretary (Mr. G. C. Crummack) submitted a list of suggested rules to bring the Leeds Branch rules into line with those for branches as outlined by the Society. These were adopted. The meeting passed a resolution (as a recommendation to the Society): "That, so far as Schedule I poisons may be concerned, local authority scripts be dealt with as in the case of N.H.I. scripts."

Considerable discussion ensued on a motion by Mr. J. H. Gough, seconded by Mr. Harold Haw: "That a smaller retention fee for non-practising pharmacists be instituted as a concession." Mr. Gough, Mr. Haw, Mr. Buckley and the secretary supported the view that chemists who had retired but desired to retain contact with their professional colleagues, or chemists who were engaged in scientific or other work which did not involve keeping open shop, should be allowed to pay a lower fee. Mr. Gough said some other professional organisations did this. He agreed there might be a certain difficulty in dealing with retired people who took up occasional locum work, but felt that was not an insurmountable difficulty. Mr. Haw remarked that in his view all requirements of such people, apart from the right to keep open shop, could fittingly be met at half the ordinary retention fee. Mr. Kemp doubted whether the Society would sanction such a concession. It would not be easy to keep so closely in touch with people on the reduced fee as to be sure they would on no occasion take up a little locum work. Any chemist granted this reduced fee should give a clear undertaking. Mr. Paul Dobson opposed the proposition. The retention fee, he assumed, was for retention of a name on the Register. The situation might, however, be met by the creation of a new membership section in the Society—an associate membership, at reduced fee conditional on an undertaking to do no practising pharmacy. Care must be taken not to make any loopholes for possible abuse or mistakes. The resolution was adopted by a considerable majority.

On behalf of the Council the chairman moved, as a message to the Society: "That federation of branches would not be of benefit to Leeds and District Branch." Branches, it was explained, already had to deal with wide areas, and Leeds Branch had as much as it could manage effectively. The proposition was carried. Mr. Buckley moved: "That the time is now ripe to again ask for commissioned rank for pharmacists in the Navy, Army and Air Force." Mr. N. N. Armitage, who had taken over the work of Benevolent Fund collector for Leeds (carried out previously by the late Mr. H. Gilleghan), was handed a cheque for £6, the proceeds of recent contributions. The secretary said the desire of the Branch council was to continue for a few weeks longer what they now termed the "Herbert Gilleghan Appeal."

London

The small Queen's Hall was discovered a year ago by the National Association of Women Pharmacists as an agreeable and central venue for their annual dance. The gathering this year was again unusual. Mrs. Skinner, Miss Hindes, Mrs. Irvine, Miss Hodgkinson and other high lights in feminine pharmacy have the knack of discovering new methods of entertainment and making them go. Consequently the 130 pharmacists and friends who attended on January 14 were given the option of having their fortunes told, talking pharmaceutical

politics in corners or dancing to new and intricate designs. The "spaewife" was popular, there being a queue waiting for palm reading, while others who kept on the floor collected many useful prizes in "spot," "musicalarms" and other dances. Among those so fortunate were Mrs. Marns (who was there with her presidential husband), Miss Currie, Mrs. A. P. Trickey, Miss Fear, Mr. Stedman, Mr. Holland and Mr. Pickering (who was lucky enough to secure two prizes). The Pharmaceutical Council was represented by the president and Mr. Herbert Skinner, while others in the company included Mr. and Mrs. C. A. Noble, Mr. and Mrs. Abbott, Mr. and Mrs. David T. Jones, Mr. and Mrs. Frank Noble, Mrs. Freke, Mrs. Linstead, Miss Sproule, Miss Dennis Hayes, Mr. P. D. Goodwin, Mr. W. B. Falding, Mr. V. C. Hewlett, Mr. B. R. Wilkinson and Mr. Clifford Evans. With obvious reluctance the function was brought to a close just on midnight by the singing of "Auld Lang Syne." Things were kept in full swing throughout the evening by the unwearied exertions of Mr. Peter Irvine as Master of Ceremonies.

Sheffield

The West Riding Insurance Committee has decided to suspend Sunday duty by chemists.

Mr. Algernon R. Gardner, who recently passed the Final examination for the Diplomas M.R.C.S., L.R.C.P., served an apprenticeship to his uncle, Mr. J. T. Appleton, M.P.S., and passed the Pharmaceutical Society's Qualifying examination in 1927. He is also a Fellow of the Spectacle Makers' Company.

Miscellaneous

ALIENS RESTRICTION (AMENDMENT) ACT.—Permission has been granted to A. L. Arnold, research and manufacturing chemist, 17 Plough Court, Fetter Lane, London, E.C.4, to use the title F.P.S. Trust.

DEFECTIVE ARROWROOT.—At Croydon, recently, Pearks Dairies, Ltd., were fined £5, with 42s. costs, for having sold arrowroot which on analysis was found to consist of 32 per cent. of genuine arrowroot, 20 per cent. of ground rice and 48 per cent. of sugar.

LEATHER TRADE SYMPOSIUM.—On February 19 and 20, a symposium organised by the International Society of Leather Trades' Chemists will be held in London. The programme includes such subjects as "The Wetting of Pigments" and "The Mechanism of Detergent Action." Full particulars may be obtained from Dr. C. H. Spiers (organising secretary), The Leathersellers' Technical College, 176 Tower Bridge Road, S.E 1.

THE ROYAL INSTITUTION.—Forthcoming Friday evening discourses at the Royal Institution include the following: On January 29, Sir William Bragg on "Recent Crystallography"; on March 19, Lord Rutherford on "The Transmutation of Heavy Elements." Tuesday lectures include three (January 19, January 26 and February 2) by Mr. N. F. Mott on "Electrical Conductivity in Solids"; and Thursday lectures, three (January 14, 21 and 28) on "Films in Scientific Education," dealing respectively with biology, physics and agriculture.

OPTICAL LEGISLATION WANTED.—A meeting of the Institute of Chemists-Opticians' Committee for Yorkshire and Lancashire was held at Leeds on January 12 to discuss the proposed regulations by the Minister of Health in regard to N.H.I. optical benefit. It was unanimously agreed that every opposition should be made to this measure as it would be detrimental to opticians. The opinion was expressed that nothing short of an Optical Bill on the same lines as the Dentists Act of 1921 would solve the problem. The secretary for the district is Mr. J. A. Sullivan, M.P.S., Four Lane Ends, Bradford.

THE PUBLIC SUPPLY OF DISINFECTANTS.—The Heanor Urban District Council's sanitary inspector has reported as follows:—"Regarding the question of disinfectants, unless these are sold, or the circumstances amount to a sale, the case does not appear to come within this Act. It has always been the practice, however, to issue disinfectant in approved poison bottles properly labelled, the person obtaining same signing a register. I consider, however, that it would be inadvisable to issue disinfectants to a child and would suggest none be issued to persons under, say, ten years of age." The Council has demanded that disinfectants be not issued to young persons under twelve years of age.

Irish Notes

Irish Drug Association

At the recent fortnightly Committee meeting of the Irish Drug Association Mr. P. A. Brady (president) was in the chair. The action of certain chemists, stated to be few in number, who nominally comply with the agreed times of closing but do not enter into the spirit of the agreement, was discussed at length. Electric signs and window lights left on after closing hours were stated to be, in most cases, the cause of complaint. The practice of leaving on lights inside shops was also reported to be a source of annoyance to many members. A special appeal was made to all chemists to comply not only with the letter but also with the spirit of the agreement as to closing hours. The Committee had before them the replies to the *questionnaire* regarding "penny sales," and noted with regret that, notwithstanding several reminders, including the issue of duplicate forms, a large number of members had failed to reply. It was again emphasised that before dealing with such a delicate question the views of all members are required. Mr. J. K. Whelehan, Mullingar, forwarded a copy of a circular sent to all members of the local Association in which full co-operation with the display schemes and other matters were dealt with.

Dublin

The annual staff dance of James Crean & Son, soap and perfumery manufacturers, North King Street, Dublin, at the Metropole Ballroom on January 18 was attended by the Lord Mayor (Alderman A. Byrne); Mr. H. E. Crean (managing director) and Mrs. Crean; Mr. J. Crean; Mr. G. D. Findlater (director) and Mrs. Findlater; Mr. D. McCullogh (director); Mr. and Mrs. R. C. Ferguson (Department of Industry and Commerce); Messrs. G. L. Layfield; E. J. Sheppard; P. J. Burke; E. Devine; J. Dempsey; and others.

The ninth annual dance of pharmaceutical chemists and students held at the Aberdeen Hall, Gresham Hotel, Dublin, on January 11, was one of the big events of the pharmaceutical season. For the first time Radio Athlone broadcast a portion of the dance music programme, which included two Irish dances. Throughout the evening valuable spot prizes were distributed to lucky couples. At the supper the first toast was "The Pharmaceutical Society of Ireland." Mr. J. A. O'Rourke (president of the Pharmaceutical Society of Ireland), responding, thanked the president and committee of the Chemists' and Students' Club for their references to the Society and wished the Club every success. Proposing "The Saorstat (Free State) Industries," Mr. S. T. McAuley (managing director, Irish Pharmaceuticals, Ltd.) thanked the committee for their kindness in years past; he was sure they all hoped for the day when industry in Ireland would be 100 per cent. Irish. There was no doubt they had within the country the skill, the directional ability, and the efficient workers to make their industries truly native. Mr. Seamus O'Murchadha (secretary of the committee) spoke to the toast "Eire."

The large company present at the dance included the Rt. Hon. The Lord Mayor (Ald. A. Byrne, T.D.); Mr. J. A. O'Rourke (president of the Pharmaceutical Society of Ireland); Dr. T. J. Kieran (Director of Broadcasting); Mr. B. P. Hickey (vice-president of the Pharmaceutical Society); Mr. S. T. McAuley (managing director, Irish Pharmaceuticals, Ltd.); Mr. B. McNamara (general manager); Mr. P. Keogh (laboratory manager); Mr. T. Gleeson (president, Pharmaceutical and Chemists' Social Club); F. C. Kavanagh (vice-president); T. B. O'Sullivan (treasurer); Seamus O'Murchadha (secretary); Dr. M. Shields, M.P.S.I. (Vincent's Hospital); Dr. P. Corbett; Dr. N. May; Mr. W. R. Such (Evans Sons Lescher & Webb, Ltd.) and many others.

The following firms contributed to the spot prize fund:—Irish Pharmaceuticals, Ltd.; Monon & McKay; Allen & Hanburys, Ltd.; Sharman, Crawford, Ltd.; Bourjois, Ltd.; Kodak, Ltd.; Parke, Davis & Co.; St. Dalmas (Ireland), Ltd.; W. & A. Gilbey, Ltd.; Aspro, Ltd.; Boys, Adamson & Co., Ltd.; Boileau & Boyd, Ltd.; Nyal Co., Ltd.; Veno Drug Co., Ltd.; Victor Hanna, Ltd.; Desmond Murray (Gillette Industries, Ltd.); Leonards Chemists, North Earl Street, Dublin; Harwood Bros., Ltd.; Evan Williams Co., Ltd.; Dixon Kitts; Thos. W. Begg & Co., Ltd.; Evans Sons Lescher & Webb (Ireland), Ltd.; Dixon & Co.; Wigglesworth, Ltd.; Thos. Guest & Co., Ltd.; P. C. Cahill & Co., Ltd.; Island Bawn Laboratories, Ltd., Nenagh; Edward Taylor, Ltd.; Ayrton, Saunders & Co. (Dublin), Ltd.; Genatosan, Ltd.; Reckitts (Ireland), Ltd.; May, Roberts (Ireland), Ltd.; Ilford, Ltd.; William Gaw, Ltd.; Hayes, Conyngham & Robinson, Ltd.; Potter & Moore, Ltd.; Yardley & Co., Ltd.; P. J. Carroll, Ltd.; Dundalk, Dundalgan Press, Ltd., Dundalk; Tokalon (Ireland), Ltd.; Rice, Steel & Co., Ltd.; Mr. S. T. McAuley, Mr. Cheeson.

Scottish Notes

Influenza in Scotland

Influenza is now sweeping Scotland, and Fife has been particularly hard hit. Many chemists have been victims. An Edinburgh firm of manufacturing and retail chemists employing a staff of over thirty found that more than 50 per cent. of the staff were absent on January 12. In Edinburgh, police, fire brigade, and post office staffs have been only slightly affected, but the transport department had over 100 absentees at one period. Office workers appeared to be the worst sufferers. The staffs of many wholesale houses have been greatly depleted, and this has necessitated working overtime for the remainder to cope with the increased orders. It is very creditable that regular deliveries have been maintained.

The peak appears to have been passed. In Edinburgh and district during the week ending January 16 influenza was named as a contributory cause in thirty-seven deaths recorded. Chemists were called upon, in addition to dispensing, to co-operate with many large employers of labour in introducing precautionary measures. In offices and factories facilities were provided for gargling daily and the premises were sprayed with disinfectant. Several firms installed medicine cabinets and any employee who complained of illness was given a dose of quinine or other medicine before being sent home. Although the type of influenza is termed mild, many cases of influenzal pneumonia have followed in its wake and there is still much severe illness in Scotland. "The number of night calls received by chemists during the present flu epidemic prompts the hope that the Standing Committee will insist on a minimum fee of 1s. on all N.H.I. 'urgent' prescriptions after hours," writes a correspondent.

So great has been the demand for qualified locums during the past week or two that they are now practically impossible to get. One wholesale firm spent many hours in Edinburgh in search of one to take duty for a chemist on the sick list, but without success. The demand for influenza medicines is believed to be unprecedented. While preventive measures are being advocated curative measures are the order of the day.

Brevities

Mr. A. Johnston, chemist and druggist, Lanark, has won £50 in a London newspaper competition. This is his third success of the kind.

The staff of the Northern Co-operative Society's drug department, Aberdeen, held their annual whist drive and dance in the Northern Hotel, Aberdeen, on January 13, when 150 persons were present. The arrangements were in the hands of a committee with Mr. G. Murray as secretary.

Edinburgh

The third meeting of the fifty-ninth session of the Edinburgh Chemists' Assistants' and Apprentices' Association was held at 36 York Place, Edinburgh, on January 15, Mr. J. Ferguson (president) in the chair. The Dey prize in chemistry and physics was presented by Dr. J. Tait to Mr. William P. Thomson. Mr. Eric Knott, Ph.C., gave an address on "The Addendum to the B.P., 1932." Mr. Knott surveyed the corrections, alterations and additions, stating that the Addendum was chiefly of interest to the wholesale manufacturer. The address was illustrated by examples of the new galenical preparations.

In furtherance of their grievance in regard to charges imposed by the Corporation for the collection of trade refuse, Edinburgh and Leith Chamber of Commerce, with other trade interests, sent a deputation to a town council on January 14. It was decided to remit the whole subject for report. In opening the meeting the deputy town clerk said that the question of charging for trade refuse was not new but, under a Consolidating Act of 1933, opportunity was taken to clarify the position. The Corporation allowed three bins of refuse per week free of charge, and of the 9,000 shops in the city, only 1,760 were liable to be charged. On behalf of the deputation, which did not accept the figures submitted, it was stated that shopkeepers objected to these excess charges, when at the same time they were paying a rate for cleansing. Shopkeepers paid two and a half to three times the amount of taxation paid by householders, and were only getting a ten per cent. service.

Topical Reflections

By Xrayser

The Council Election

of the Pharmaceutical Society, although still some distance off, is already engaging much private consideration. There are qualms in various quarters, especially in connexion with those candidates who, directly or indirectly, have chain-store or patent-medicine associations. From conversations with other pharmacists I gather that the recalcitrant members who favour further retail representation are growing in strength. I cannot agree that a 100 per cent. retail Pharmaceutical Council is altogether desirable, for one wants as varied a trade experience as possible on the ruling body. But I sense the increasing discontent among genuine retailers concerning the growth of cheap bazaar, co-operative and chain-store trading in commodities which rightly should be restricted to the chemist. Those responsible for the Pharmacy and Poisons Act have apparently lost the confidence of the rank and file, and there are timid attempts at protest. The Council election affords the opportunity. Incidentally, I am glad to learn that this year a woman pharmacist is again to seek the suffrages of the electors ; and in view of the considerable proportion of women in pharmacy and the need for the practical woman's point of view I hope she will come out at or near the top of the poll.

The Special General Meeting

of the Pharmaceutical Society to "approve of and concur in" the draft mortgage deed for the new building in Brunswick Square is to take place, I see, on the first Wednesday in February. The gathering is timed for 10.30 a.m., so members in the provinces who wish to attend will either have to be up early or pass the previous night in London. It is difficult to understand how a representative gathering of members can be expected in these circumstances, and it would be an interesting experiment for the Council to offer, from their ample funds, to pay the expenses of delegates anxious to be present as representing their various associations. As it is, the result of the meeting is a foregone conclusion. Few members, either in town or country, can spare either the time or the money to come up specially, and the members of the Council will be there in full force, for the date is that of the February Council meeting. So one may expect the usual milk-and-watery affair.

I Like the Title

"On Our Bookshelves" (*C. & D.*, January 16, p. 58); it should suggest to your readers that the chemist has, or had, some claims to culture. I am not sure whether the claim can be made to-day to the same extent. For one thing, we have not the time ; life is lived at greater pressure ; the opportunities for relaxation and quiet thought are very few ; and when we have time for such it is more usually passed in a car ride, a game of golf, or a visit to the "pictures." The vogue for reading has gone out—and not only in pharmacy. There are probably too many books, and the multiplicity of daily and weekly papers and magazines provide all that can be absorbed (whether digested is doubtful). In a business paper a few weeks ago there was an article in which the writer compared the modern "traveller" with the old-fashioned type ; he stated that the "man on the road" has little opportunity for acquiring culture compared with his pre-war predecessor. He blamed the motor car for this ; the long railway journeys formerly made gave opportunity for reading not possible now. I can bear out his statement regarding the old type of representative ; my apprentice employer benefited a good deal from the calls of certain travellers.

Legal Reports

Dangerous Drugs Acts.—At Bargoed Police Court, on January 15, Mr. Solomon L. Rosenbaum, chemist and druggist, was charged with having failed to keep "dangerous" drugs in a locked receptacle. It was stated that on the defendant's premises, in October last, a hairdressers' assistant named Miss Roper was found dead, and an assistant of the defendant named William John Thomas was found on the floor suffering from the effects of poisoning. Mr. Walter, prosecuting for the Glamorgan County Council, explained that the maximum penalty for this offence under the Regulations was £250 or imprisonment up to a term of twelve months. It appeared that when questioned the defendant stated that Thomas had a key to fit the poisons cupboard. Mr. Rosenbaum now explained to the Court that a few days before the tragedy he had occasion to use the dangerous drugs cupboard, and experienced some difficulty with the lock. Thomas produced a key, which was very similar to the one he (Mr. Rosenbaum) had. Witness tried it and found it fitted. He intended changing the lock. He was fined £5.—At Wolverhampton, on January 19, Dr. Philip G. Bainbridge was fined 5s. on each of several summonses for failing to enter particulars of "dangerous" drugs received, with £10 10s. costs. It was stated that the defendant had sold his practice on account of addiction, and was willing to enter an institution.

Petition Refused.—In the Chancery Division of the High Court, London, on January 20, Mr. Justice Luxmoore heard a petition by the British Oxygen Co., Ltd., London, Christian W. P. Heylandt, Berlin, Heylandt Gesellschaft fur Apparatebau G.m.b.H., Berlin-Britz, Aktiengesellschaft fur Industrie-Gasverwertung, Berlin-Britz, Fluega Aktiengesellschaft, St. Moritz, Switzerland, and Metal Industries, Ltd., asking for the extension of letters patent granted to William Edward Evans on July 12, 1920. Sir Stafford Cripps, K.C., Mr. Trevor Watson, K.C., and Mr. Reginald Jones appeared for the applicants; Mr. L. Heald and Mr. J. P. Graham for the Comptroller of Patents in opposition to the petition. Sir Stafford Cripps stated that Mr. C. W. P. Heylandt was the inventor of a number of inventions relating to the liquefying of gases and their storage and transport in the liquid state. The letters patent in question related to one of the most important inventions comprised in the Heylandt process, and disclosed an improved method of transporting and storing liquefied gases and delivering them for use in the liquid or gaseous state. The German and Swiss companies were formed to take over or develop the patent, and the invention was communicated to Mr. W. E. Evans, their patent agent in this country, for the purpose of obtaining letters patent here in trust for the German companies. It was not possible to exploit the invention commercially before 1926, and subsequently a licence to work it was granted to Metal Industries, Ltd. In 1932 Metal Industries sold their rights under the patent to the British Oxygen Co., Ltd., who issued to the former company certain shares and an option. Partly owing to the war and to economic difficulties afterwards, it was not possible to develop the invention commercially, and means of manufacturing liquid oxygen on a large scale were not available until about 1927. Plants for working the Heylandt process were now in operation or under construction at Birmingham, Rotherham, Glasgow, Wolverhampton and Wembley. The remuneration, however, had not been adequate having regard to the great utility of the invention. The patent expired in July 1936. A sum of £200,000 had been spent on plant, material, etc., in developing the liquid oxygen business of the British Oxygen Co. Evidence was called in support of the applicants' case. Mr. Heald said the British Oxygen Co. came into possession of the patent at a late stage in its career. They must have appreciated that it might be desirable to apply for its extension, but they had not kept any separate account of the liquid oxygen business. It was only when the Court was satisfied with regard to the question of remuneration that it had any jurisdiction to grant an extension. In this case it was impossible to say what had been the remuneration, but it had been considerable. An extension of the patent would give the applicants practically a monopoly of the liquid oxygen trade. His lordship said he was unable to ascertain what remuneration had been received from the patent. The British Oxygen Co. acquired it in an amalgamation with another company at a time when the patent had only three and a half years to run, and during that period they made considerable profits as proprietors of the patent and as manufacturers under it. He was unable to say that any of the persons who had been interested in the patent, whether taken as a whole or separately, had been inadequately remunerated, and in those circumstances the petition must be refused.

Pharmacy and Poisons Act, 1933.—At Kingston-on-Thames Police Court, on January 13, Mr. Robert Lindsay, chemist and druggist, trading as G. Harris, London Road, Kingston Hill, was summoned for failing to retain prescriptions—one in respect of veronal, one of allonal and three of luminal—at the premises where they were dispensed. Mr. C. E. Shelly appeared for the defendant, and entered a plea of "Guilty." Mr. A. C. Castle, prosecuting, said that on September 28 one of the Society's inspectors called at Mr. Lindsay's premises. After inspecting the prescription-book the officer asked for the production of the original prescriptions in respect of five entries in the book in accordance with the Poisons Rules. The assistant was unable to produce them, as apparently they had been handed back to the customers. The defendant himself was not on the premises at the time. Mr. Shelly said he did not question the facts. The offences were due to the omission of an assistant, a man with thirty years' experience. The offence was a purely technical one, and the prescriptions were cancelled by being stamped before they were handed back to the customers. In reply to the Mayor, Mr. Castle said the present prosecution was the first of its kind in England. He added that a chemist would be wrong if he dispensed prescriptions which had been stamped as cancelled, but in practice it was sometimes done. After retiring, the Mayor announced that the justices had decided to impose a fine of £1 on each of the five summonses, with £3 3s. costs.

At Tower Bridge Police Court, London, on January 14, three summonses against Johnston's (Cash Chemists), Ltd., Trundley's Road, S.E.8, were heard. The information on behalf of the Pharmaceutical Society stated that "on October 21, at Trundley's Road, defendant had unlawfully used an emblem or coat of arms of the Society, reasonably calculated to suggest that S. E. M. Johnston possessed a qualification with respect to selling, dispensing, or compounding drugs and poisons other than the qualification that he, in fact, possessed." A second summons was for unlawfully taking or using the title "Member of the Pharmaceutical Society of Great Britain." There was a third summons "for unlawfully using a description, namely 'Proprictor S. E. M. Johnston,' reasonably calculated to suggest that S. E. M. Johnston possessed a qualification with respect to selling, etc., other than the qualification that he in fact possessed." Mr. A. C. Castle, solicitor, prosecuted; Mr. Baker, barrister, defended and pleaded "Guilty." Mr. Castle said the defendant company carried on business as chemists. On October 22, 1936, a letter was addressed to the Pharmaceutical Society, and the letter heading bore the words and coat of arms referred to. Mr. Baker explained that S. E. M. Johnston was a lady. The paper complained of was only used when writing to wholesalers, etc., so that the evil the Act was meant to avoid was never committed. Miss Johnston was a director of the company. She had, in fact, sent the letter heading to the Society itself, and in his submission that showed she was perfectly unaware that any offence had been committed. At the time there was a director who was actually a member of the Society, and had his name been used instead there could have been no complaint. Directly the facts were brought to her notice Miss Johnston had all the paper then in hand, and the blocks, destroyed; and he submitted this was a case that might be dealt with under the Probation of Offenders Act. The Magistrate: This is a serious matter. I will fine her £5 on the first summons; the other two will not be separately dealt with. There will be an order for payment of 42s. costs.

At Warrington Police Court, recently, Victoria Eckersley, Green Street, was summoned for unlawfully using the word "pharmacy." Mr. Unsworth, defending, admitted that there had been a technical breach of the Act, but explained that the bottles which the defendant had bearing the word were supplied by wholesalers, and she had no intention of holding herself out as a chemist. A fine of 20s. was imposed.

New Companies and Company News

P.C. means Private Company and R.O. Registered Office

T. W. Traders, Ltd. (P.C.).—Capital £100. Objects: To carry on the business of chemists, druggists, etc. R.O.: 1 Lansbury Drive, Hayes, Middlesex.

C. B. Baker (Chemist), Ltd. (P.C.).—Capital £1,200. Objects: To acquire the business of a chemist carried on by Chas. B. Baker at Abbey Street, Nuneaton.

Karvally Products, Ltd. (P.C.).—Capital £1,000. Objects: To carry on business as manufacturers of and dealers in chemicals, drugs, oils, colours, etc. R.O.: 8/10 Dalling Road, W.6.

Fyans & Mitchell Stern, Ltd. (P.C.).—Capital £500. Objects: To carry on the business of pharmaceutical chemists and druggists, and opticians, etc. R.O.: 579 Lord Street, Southport, Lancs.

Hygienic Brands, Ltd. (P.C.).—Capital £300. Objects: To carry on the business of manufacturers of perfumery, toilet articles, pharmaceutical preparations, etc. R.O.: 43 Springfield Road, Moseley, Birmingham.

N.D.I., Ltd. (P.C.).—Capital £100. Objects: To carry on the business of chemists, druggists and drysalters, etc. The first directors are to be appointed. Solicitors: Ashurst, Morris, Crisp & Co., 17 Throgmorton Avenue, E.C.2. R.O. not given.

Perrier Water, Ltd. (P.C.).—Capital £100. Objects: To carry on business as manufacturers of and dealers in mineral and aerated waters, etc. The directors are to be appointed. Solicitors: E. F. Turner & Sons, 115 Leadenhall Street, E.C.3.

Pharmacie, Ltd. (P.C.).—Capital £2,000. Objects: To carry on the business of manufacturers, importers and exporters of toilet preparations, perfumes, etc. The first directors are to be appointed. Solicitors: Slaughter & May, 18 Austin Friars, E.C.2.

J. W. Hockley, Ltd. (P.C.).—Capital £500. Objects: To carry on the business of druggists, manufacturers of and wholesale and retail dealers in chemicals and disinfectants, etc. The first directors are to be appointed. R.O.: 170 Bishopsgate, E.C.2.

Apladae, Ltd. (P.C.).—Capital £300. Objects: To acquire from A. B. D. Lang and R. W. B. Billinghurst the goodwill of and all their rights in the medicinal preparation known as "Apladae," etc. R.O.: Bassishaw House, Basinghall Street, E.C.2.

Marlborough Crystal Glass Co., Ltd. (P.C.).—Capital £1,000. Objects: To carry on the business of manufacturers and dealers in glass and glassware of all kinds, and in bottles, jars, and receptacles, etc. R.O.: 6 Kirby Street, Ancoats, Manchester.

Jourdon Co., Ltd. (P.C.).—Capital £1,500. Objects: To carry on business as manufacturers and dealers in cosmetics, soaps, dyes, chemicals, and toilet preparations, etc. The first directors are to be appointed. Secretary: Maurice West, 71 Brentham Way, Ealing, W.5.

Assurol, Ltd. (P.C.).—Capital £100 Objects: To carry on the business of manufacturers and vendors of biological, pharmaceutical and medical preparations; chemists, druggists, etc. The first directors are to be appointed. Secretary: W. R. Patterson, 6A Tudor Street, E.C.4.

First Aid Services, Ltd. (P.C.).—Capital £1,000. Objects: To acquire the business of P. Exley & Son and the property and assets comprised in an agreement with P. A. and A. C. Exley and to carry on the business of dealers in first-aid equipment of all kinds, etc. R.O.: 13 East Parade, Leeds, 1.

Surrey Proprietaries, Ltd. (P.C.).—Capital £500. Objects: To carry on the business of dealers in pharmaceutical, medicinal, industrial and other preparations, etc. Geo. S. Priddle, 2 Glenhurst Mansions, Southchurch Road, Southend-on-Sea, secretary. The first directors are to be appointed.

Jordan & Sons, company registration agents, Chancery Lane, London, W.C.2, in their annual statistical report relating to companies registered during the year ended December 31, 1936, state that, under the class "Chemicals" seven public companies were registered with a total capital of £686,250 (1935: nine, £1,161,050). The number of private companies registered during 1936 under the class "Chemicals" was 483, with a total capital of £2,135,950 (1935: 489, £2,361,761). The combined totals of public and private companies of this class for 1936 were 490 registrations, with a total capital of £2,822,200 (1935: 498, £3,522,811).

A. Millar & Co., Ltd., Dublin.—The directors' report and accounts for the year ended October 31, 1936, show that, after making due provision for salaries, repairs, bad debts, directors' fees, etc., the net profit, including the balance of £6,816 6s. 6d. brought forward from last year, amounts to £11,413 14s. 2d. An interim dividend of 5 per cent. per annum on the preference shares was paid last June, amounting, less income tax, to £1,162 10s., leaving a balance of £10,251 4s. 2d. A final dividend on the preference shares at the rate of 5 per cent., less income tax, £1,162 10s., was paid in December last. There remains a sum of £9,088 14s. 2d., out of which the directors recommend the payment of a dividend on the ordinary shares of 3 per cent. per annum, less income tax, £2,325; carried forward, £6,763 14s. 2d. The directors much regret the death of Mr. R. G. Tomlinson, who had been connected with the company for sixty-two years. Mr. J. W. Morgan, late secretary, who has been in the service of the company for over half a century, was co-opted in his place. He and Mr. R. N. Millar retire by rotation, and both being eligible offer themselves for re-election.

Voluntary Liquidation

Jeffrey Carter Ltd., 40 Church Road, Ilford, wholesale chemists. Pursuant to Section 238 of the Companies Act the statutory meeting of creditors of the above was held recently at the Incorporated Accountants' Hall, London, W.C., when the chair was occupied by Mr. D. J. Carter, the chairman of the company. A statement of affairs was submitted which showed liabilities of £2,360 7s. The assets totalled £1,293 8s. 6d., or a deficiency of £1,066 18s. 6d. The company, it was stated, was formed on January 31, 1934, with a capital of £200. There was a serious drop in the turnover because it was impossible to join the P.A.T.A., and it was not until twenty months after the formation of the company that membership of the P.A.T.A. was granted. During the twelve months to March 31, 1935, the turnover was £2,006, and in the following year it was £4,929. During the nine months to date the turnover had been £4,885. The directors realised that it was necessary to maintain a large turnover and to keep down expenses, but the company was handicapped by lack of finance. The balance sheet for the year to March 31, 1936, showed a loss of £252, whilst in the previous year there was a loss sustained of £411. During the last nine months there had been a further loss of just over £200. Mr. D. J. Carter intimated his willingness to withdraw his claim for undrawn salary of £750, and he made an offer to the creditors of 15s. in the £. The creditors decided that the voluntary liquidation of the company should be continued, with Mr. Parkin S. Booth, of the Association of Manufacturing Chemists, and Mr. C. Wakelin, of 8 Serjeant's Inn, London, as joint liquidators. A committee of inspection was also appointed.

Gazette

Bankruptcy Acts

Adjudication

Thomas, A. M., and Thomas, F. L. M., 2 High Street, Leominster, chemists and druggists.

West End Business Discussion

A MEETING of the London Western Branch of the National Pharmaceutical Union was held at Stewart's Restaurant, Old Bond Street, W.1, on January 13. It was one of the best-attended meetings the Branch had held for many years, and the large audience fully appreciated a stimulating address by Mr. G. A. Mallinson, secretary of the Union. Mr. Mallinson chose for his address "Matters of Moment in Pharmacy." Dealing first with gas warfare, he pointed out that the N.P.U. was not directly responsible for the organisation of chemists with regard to the provisions being made to combat gas attacks in case of war—that was a matter for the Pharmaceutical Society. Whether the authorities decided to avail themselves of the services of pharmacists or not, it was becoming obvious that the public would look to pharmacists to advise them, and it behoved them to maintain the prestige of pharmacy by giving accurate information.

The new Poison Rules, and particularly those relating to labelling, were causing some confusion and trouble to pharmacists. The N.P.U. services were available for such matters, and pharmacists were invited to submit any labels on which they required information to the N.P.U. Mr. Mallinson referred to the "spate" of company formations affecting pharmacy and the concern which many chemists felt over the matter. He was not unduly worried about it; private pharmacists still conducted over 75 per cent. of the retail pharmacies, and the personality of the proprietor pharmacist was a tremendous asset. Chemists had only themselves to blame for allowing pharmacy to become the happy hunting-ground of the company promoter owing to the readiness with which they were prepared to give options on their businesses.

The deliberations of the Medicine Stamp Duties Select Committee, continued Mr. Mallinson, were of the greatest importance to pharmacy, and the repercussions of the decisions of that Committee might affect them seriously. Never before had there been such unanimity among the representatives of pharmacy at a Government inquiry. He was satisfied that the Committee was impressed by the evidence given on behalf of pharmacy, but it was impossible to forecast the result. (He reviewed the negotiations which led up to the passing of the Shops (Sunday Trading Restriction) Act.)

Whatever the outcome of the inquiry, it was obvious the Chemists' Friends scheme was more than ever necessary to pharmacy; and it was fortunate that the movement was started before the inquiry was instituted. The C.F. scheme was not an ethical or nebulous movement; it was definitely a practical policy. Chemists existed upon their reputation with the public, which was associated with the goods they displayed; and he wondered how long the public was going to retain its respect for chemists when it observed them displaying the same goods as other traders. Their prestige and standing with the public were very high and of inestimable value; the company chemists were alive to this fact, as was proved by the way they were endeavouring to emphasise the idea that they were chemists. Pharmacists were asked to show some C.F. goods, but more particularly to make their windows pharmaceutical and so help to build up their reputations. The success of the movement was being closely watched by other trades; if it were to fail, they would be encouraged to make further attacks upon the chemists' business. Government departments were also watching them. The movement must succeed, or pharmacy would be disgraced. He had received numerous letters from members who had been operating the scheme. They all stated that they were satisfied with the results, judged from turnover and profit, when the scheme had been fully supported. Chemists were not asked to do anything contrary to sound business policy. He repeated the accountants' figures given at Liverpool (*C. & D.*, December 19, p. 695). This was not a big sacrifice to make in order to maintain their reputation.

After numerous questions had been put to Mr. Mallinson, Mr. Ratcliffe (secretary of the Wembley Branch) was invited by the chairman to speak. Having paid a tribute to the efforts and time expended by Mr. Mallinson on behalf of pharmacy, he outlined the work done by the Wembley Branch, where they were 100 per cent. strong in support of the scheme. They were satisfied that their adoption of the scheme had proved beneficial to their businesses, and even if the C.F. scheme were to fail they in Wembley would not abandon their present policy. A hearty vote of thanks to Mr. Mallinson was proposed by Mr. E. C. Evans.

Proprietary Articles Trade Association

THE quarterly meeting of the P.A.T.A. Council was held on January 14 at the Hotel Russell, London, W.C.1, the retiring president (Mr. A. T. Hall) in the chair at the outset. MR. HALL extended a welcome to the new member of the Council, Mr. S. W. Hague, who suitably acknowledged the greeting.

The Council noted that a grant of £1,000 had been made to the Glyn-Jones Memorial Fund by the trustees of the estate of the late Lord Leverhulme. The Council resolved to contribute to the Fund £200 a year for the next five years.

In view of the fact that the Trade Marks (Amendment) Bill, 1936, contains no provision for empowering the owner of a registered trade mark to attach re-sale conditions to the goods bearing the trade mark, the Council decided that every endeavour should be made to secure the inclusion in the Bill of the necessary amendment.

The Council considered the position arising from the expiration of the contract under which the "Chemists' Trade Record" and the P.A.T.A. "Year-Book" are at present published. The Council approved the recommendation of the Executive Committee that publication of the "Record" should cease with the February issue, and that the necessary arrangements be made by the Association for the uninterrupted publication of the official "Year-Book and Protected List." The Council also approved the Committee's recommendation that the periodical list of additions to and revisions in the Protected List be published in the editorial pages of "The Pharmaceutical Journal," and be available also for publication by the trade Press generally.

In accordance with custom, the president for this year is nominated by the retail section. Mr. Thomas Marns was proposed as president by MR. N. N. ARMITAGE, who said that as a member of the Council for the past ten years and chairman of the retail section for the past three, Mr. Marns had earned the respect and affection of his colleagues. Mr. Marns would occupy a unique position in that he would be concurrently president of the Pharmaceutical Society and of the P.A.T.A. The motion was seconded by MR. F. J. SMITH, supported by MR. RATCLIFFE, MR. HIGGS, MR. MILNER and MR. HALL, and carried with acclamation.

MR. MARNS then took the chair and thanked the Council for the honour conferred upon him. He said that the late Sir William Glyn-Jones had impressed on him the fact that the P.A.T.A., which represented harmonious combination between manufacturers, wholesalers and retailers for one purpose, price maintenance, should never be permitted to be diverted from that object or engage in activities or controversies outside its own sphere.

THE PRESIDENT moved that a vote of thanks be recorded to the retiring president for his many services during the past year. The motion was seconded by MR. GODBER, supported by MR. BIRKS and MR. HIGGS, and carried unanimously.

MR. HALL expressed his thanks for the appreciative references to his services and referred to the pleasure he had experienced in discharging his duties.

The Council elected as vice-presidents Mr. G. M. Garcia (manufacturers' section), Mr. L. Barclay (wholesale section), and Mr. E. H. Simmons (retail section). Mr. A. T. Webb was re-elected treasurer.

The Council elected to the Executive Committee Messrs. J. Godber, A. Higgs, W. S. Howells, W. W. Knott, H. H. Marshall, F. J. Smith and S. Watson.

The secretaries submitted a report on the price-maintenance work of the Association during the past twelve months, with particular reference to the past quarter. The Association had been extremely active in investigating the price-cutters' sources of supply, and during the year had traced 508 sources.

Pharmaceutical Society of Ireland

Council Meeting

THE January meeting of the Council was held on January 12 at 67 Lower Mount Street, Dublin, Mr. J. A. O'Rourke (president) in the chair. Other members of the Council present were Messrs. B. P. Hickey, F. J. Fitzpatrick, P. C. Cahill, J. F. Costello, C. Cremen, D. W. P. Boyd, J. Duggan, J. T. Dwyer, P. Brooke Kelly, J. Gleeson, M. J. Kieran, Dr. J. A. Mitchell, Sir Thomas Robinson, Miss F. M. Flood, Messrs. M. J. Parkes, J. V. McKeever, and W. J. McKnight.

CORRESPONDENCE

Arising out of the minutes of the last meeting, THE REGISTRAR (Mr. J. J. Kerr) said he had written to the Bank of Ireland, and they had sent him a form of order on the Bank for use by members who wished to pay their subscription to the Society through banker's order. He proposed to send out copies of this order to members.

Mr. P. J. Fielding wrote apologising for inability to attend the meeting owing to illness.

THE PRESIDENT: I think we should send an expression of sympathy to Mr. Fielding as an old member of the Council, with the hope that he will have a speedy recovery.

Christmas and New Year greetings were received from his Excellency the Papal Nuncio; the President and Council of the Pharmaceutical Society of Great Britain; the President and Council of the Pharmaceutical Society of Northern Ireland; the Pharmacy Board of Tasmania; and the Smithsonian Institute. The relatives of the late Mrs. Celia Higgins, M.P.S.I., wrote thanking the Council for kind expression of sympathy.

Mr. H. N. Linstead, secretary of the Pharmaceutical Society of Great Britain, wrote asking the Council to nominate one or two members who would act for the Free State on the Codex Revision Committee.

On the motion of MR. PARKES, seconded by MR. CAHILL, Mr. Fitzpatrick and Mr. Brooke Kelly were nominated as the Society's representatives on the Committee.

A letter was received from Mr. T. Esmond, on behalf of the Chemists' Branch of the Irish Union of Distributive Workers and Clerks, asking the Council to receive a deputation in connexion with the Society's proposed changes in the Preliminary examination. The Council decided to receive the deputation at its February meeting.

WARBLE FLY AMENDMENT ORDER

Mr. D. Twomey, Secretary of the Department of Agriculture, wrote forwarding a copy of the Warble Fly (Treatment of Cattle) (Amendment) Order, 1936. This Order states:—

Section 6 Article 12 of the present Order is hereby amended by the insertion after paragraph (2) of the said Article of the following additional paragraph, and the Order shall be construed and have effect accordingly, that is to say:

(3) It shall not be lawful for any person to sell or offer for sale any article whatever purporting to be a cure or alleviation of warble fly infestation unless (*a*) Such article is either Cattle Wash (Warble Fly) Powder or Cattle Wash (Warble Fly) (Compound) Powder. (*b*) Such article is approved by the Minister.

REGISTRATION ITEMS

The following, who submitted marriage certificates, were granted change of name in the Register:—Mrs. M. B. Boyle (*née* Gildea), L.P.S.I.; Mrs. McCarthy (*née* Marshall), M.P.S.I.; Mrs. M. E. Mullin (*née* McMahon), L.P.S.I.

Matriculation certificates were submitted by the following, who were granted Preliminary registration:—Misses Teresa F. Ellis and E. V. Lynam, Messrs. M. H. Koss and Owen O'Malley.

The following changes of address were notified:—

Miss F. M. Flood, M.C.P.S.I., from Olney, Terenure Road, to 140 Terenure Road North, Dublin. Mr. C. I. Davis, M.P.S.I., from 179 Clonliffe Road to 34 Fairview Strand, Dublin. Mr. E. Meagher, M.P.S.I., from 2 Clyde Road to 10 Upper Baggot Street, Dublin. Mr. G. H. Miller, L.P.S.I., from 143 Capel Street, Dublin, to c/o McManus' Pharmacy, 5 Dolphins Barn, Dublin. Mr. T. F. Bell, L.P.S.I., from 62 Quay, Waterford, to Powerscourt House, Tramore, co. Waterford. Mr. C. A. Collis, L.P.S.I., from 31 Cabra Road, Dublin, to Main Street, Finglas, co. Dublin. Mr. J. B. Alister, L.P.S.I., from 62 Inchicore Road, Dublin, to Sally Park, Clondalkin, co. Dublin. Mrs. A. Linnane, L.P.S.I., from 62 Thomas Street, to 38B South Richmond Street, Dublin. Mr. L. J. Walsh, L.P.S.I., from Navan, co. Meath, to Medical Hall, Maghera, co. Derry. Mr. D. L. Day, Asst., from Glenholme, Highfield Park, Rhyl, to "Ranleigh," Worthing. Mr. Jeremiah O'Riordan, Asst., from Boherbue, Banteer, co. Cork, to c/o J. F. O'Neill, L.P.S.I., Baldwin Street, Mitchelstown. Mr. J. D. O'Reilly, Asst., from 29 Main Street, Bray, to the Pembroke Pharmacy, Ballsbridge, co. Dublin. Mr. R. Burchall, R.D., from 62 Quay to 9 John's Hill, Waterford. Mr. J. Connolly, Asst., from Clooney, Cliffoney, co. Sligo, to Connolly's Medical Hall, Ballinlough. Mr. J. J. Costello, R.D., from 39 Sandford Avenue, S.C. Road, to 108 Upper Drumcondra Road, Whitehall, Dublin.

REPORTS FROM COMMITTEES

The reports of the House, Law, Schools, Certificates and Declarations Committees were approved. The report of the last-named Committee stated that the applications of twenty-nine candidates for the coming Licence examination had been passed.

REPORT FROM THE REGISTRAR

The registrar reported on the death of Mr. J. H. Davis, Assistant. A report was also supplied by the registrar on the recent prosecution against the Rathkeale Pharmacy, Ltd.

ELECTIONS AND NOMINATIONS

The following were elected to membership of the Society:—Mrs. S. Kingston, Messrs. S. J. Collins, G. Keogh, G. Rush and P. Teehan.

The following were nominated for membership:—Miss J. Lawson and Mr. J. B. O'Reilly.

A Gastric Buffer

IN a letter to "The Lancet" of January 16 (p. 172), S. Gereb and F. Korösky of Budapest give details of results obtained with a gastric buffer devised by the latter collaborator. The optimum acidity for peptic digestion, the authors state, ranges from *p*H 1.5 to about *p*H 4.0; below 1.5 the stomach is liable to be attacked by its own contents, and above 4.0 pepsin ceases to act. From this it may be supposed that disorders due to irregular acidity of the gastric juice will be relieved by a remedy that maintains a hydrogen ion concentration near the optimum. Such a remedy, unlike the acids and alkalis usually employed, should be capable of correcting both excessive acidity and excessive alkalinity. This property is possessed by the substances known as buffers. In searching for a physiologically harmless buffer with a *p*H of about 2-3, Dr. Korösky devised a mixture of sodium biphosphate (86 parts) and sodium bisulphate (14 parts), and this is now sold under the name of optacid. The buffering capacity of the mixture is far greater against acids than against alkalis; but it is right that this should be so, because the contents of the stomach have to pass into the duodenum and be made alkaline for tryptic digestion. Hitherto almost every chemical treatment of hyperacidity is based on the neutralising action of alkaline—or at most neutral—compounds. But complete neutralisation of the contents of the stomach is by no means always desirable.

The authors believe that acidosis need not be feared, though it is wiser not to try the new remedy in patients already acidotic (e.g., in severe diabetes or renal disease). Optacid acidifies the urine, and the acid reaction prevents the possible formation of phosphate stones. In the treatment of gastric disorders they give optacid in tablets of one gram or in small granules. One gram is usually taken at breakfast and two at dinner and supper.

Patients with deficiency of acid usually respond to treatment within a few days, but if pepsin also is absent from the juice it will have to be added. Really serious affections of the mucosa (e.g., in pernicious anæmia) are probably outside the range of the new medicine, and in very severe gastritis the neutral buffer action of mucin can only be overcome by large doses of optacid. The results with superacidity are equally satisfactory, both in ulcer cases and in "functional" disorders. Of thirty-nine patients with peptic ulcer seven were not benefited however; in two of these the secretion of acid was normal, and they think it likely that normal gastric acidity is sometimes sufficient to excite the damaged mucosa of a stomach, so that in these cases of peptic ulcer it may be good treatment to neutralise the gastric acid completely for a time.

Pharmaceutical Society of Northern Ireland

Council Meeting

THE monthly meeting of the Council was held in the Society's offices on January 15, the president (Mr. Samuel Gibson) in the chair. There were present Messrs. S. H. Forrest (vice-president), John Gray, James Glendinning, William Martin, J. T. Nicholl, Walter Tate, John McGregor, Charles Abernethy, James McDowell, J. E. Connor, Professor James Small, Professor E. C. B. Mayrs, and Dr. S. E. A. Acheson. Mr. D. L. Kirkpatrick (secretary) was in attendance.

VOTE OF SYMPATHY

On the motion of MR. FORREST a vote of sympathy with the president on the death of his brother (Mr. Alfred Gibson) and his mother-in-law was passed.

THE PRESIDENT returned thanks for the sympathy of the Council.

GIFT OF REPLICA

The Wellcome Foundation, Ltd., forwarded a replica of the medal struck in honour of the late Dr. F. B. Power, and asked that it should be placed in the Museum of the Society.

The replica was accepted with thanks, THE PRESIDENT and others expressing appreciation of the gift. The secretary was empowered to provide a case for the replica.

CORRESPONDENCE

A prospective candidate for the June examination wrote asking if the Addendum to the British Pharmacopœia, 1932, would be included in the syllabus for the June examination.

PROFESSOR SMALL said the Addendum was official since January 1.

THE SECRETARY said it would be used in the June examination.

A letter was read from the Pharmaceutical Society of Great Britain, on behalf of the Codex Revision Committee, inviting the Society to nominate for appointment by the Council one or two persons who would be prepared to act in an advisory capacity for Northern Ireland in connexion with the proposed committee on which the societies of India and the Dominions have been invited to appoint representatives.

PROFESSOR SMALL suggested the name of Mr. Theophilus Harper as a pharmacist and Professor Mayrs as a pharmacologist. They were accordingly nominated.

The Ministry of Home Affairs wrote approving of the appointment of the examiners who were appointed at the December meeting.

THE SECRETARY said he would call a meeting for the beginning of February to fix the date of the examinations.

LEGISLATIVE PROPOSALS

The following letter, dated December 29, 1936, and signed by an assistant secretary of the Ministry of Home Affairs, was read:—

"I am directed by the Minister of Home Affairs to refer to your letter of the 23rd ultimo forwarding copy of a letter received by your Society from the Ulster Chemists' Association relative to the limiting of corporate bodies carrying on the business of pharmaceutical chemists by insisting that the superintendent of the corporate body should hold a considerable interest in the firm of which he is superintendent. In this connexion I am to point out that the Minister has given the proposal of the Ulster Chemists' Association and the recommendation of the Pharmaceutical Society most careful consideration, and has come to the conclusion that he could not agree to introducing legislation along the lines suggested. He is quite satisfied that the firms at present carrying on the business of pharmaceutical chemists—and which would be debarred from doing so were legislation passed giving effect to your recommendations—are carrying on their businesses efficiently, and in accordance with both the letter and spirit of pharmacy legislation. The Minister further considers that these firms are serving the general public just as efficiently as are those businesses which are either solely controlled by pharmaceutical chemists or in which pharmaceutical chemists hold a commanding number of shares. He would also point out that firms established along the lines to which you have taken exception are, under statute, carrying on the business of pharmaceutical chemists in Great Britain.

"The Minister also desires me to refer to the second paragraph of your letter under reply inquiring if there is any possibility of the resolution submitted by the Medical Faculty of Queen's University, Belfast, in October 1930, becoming operative in the near future. As your Society is fully aware, following on the passing of the Pharmacy and Poisons Act, 1933, in Great Britain, a new Poisons List and Poison Rules have been formulated under that Act. The Minister considers that as yet it is too early to appreciate fully the advantages or disadvantages which would accrue were similar legislation passed in Northern Ireland, and, in the circumstances, he does not propose to take such action at present. He fully appreciates, however, the necessity of safeguarding the public along the lines suggested by the Medical Faculty of Queen's University, and suggests that a sufficient control of the sale of the substance mentioned in the resolution of that Faculty could be obtained by making those substances either Part I or Part II Poisons under the Pharmacy and Poisons Act (Northern Ireland), 1925. The Minister would be glad if your Society would consider this question and obtain the views of the Medical Faculty therein."

The secretary was directed to send a copy of the letter to the Ulster Chemists' Association. The Council referred the letter to the Law Committee to report at the earliest possible moment.

DR. ACHESON: To what good? There is nothing to discuss. That is a final letter.

MR. FORREST: I agree with Dr. Acheson.

PROFESSOR SMALL: You cannot do anything as a result of the discussion, but it is better to have it ventilated.

MR. CONNOR said it seemed their qualification as chemists was very little use when unqualified men could carry on. The matter should be left to the Law Committee to send a deputation to the Ministry.

DR. ACHESON: Get your licentiates not to act for these firms.

THE PRESIDENT said the letter of the law was being carried out by these companies, but he contended the spirit was not being carried out.

GREETINGS

Season's greetings were received from the Pharmacy Boards of Queensland, Tasmania, New South Wales, the president and Councils of the Pharmaceutical Societies of Great Britain and Ireland, and the Ontario College of Pharmacy.

REPORTS FROM EXAMINERS

The reports of the examiners on the December examinations were read as follows:—

PHYSICS.—Much of the work in both the theoretical and practical examinations was good, and some of very high standard. The only general comment I have to make is that oral examination revealed that candidates often had a better knowledge than they had shown in writing. Such candidates at least would stand a better chance at an examination if it were possible for them to do more test papers and written work whilst preparing for the examination; I realise, of course, that this would involve more work for both teachers and students. Two mistakes were made by a considerable number of candidates: (*a*) it was stated that the zero point of a thermometer is found by putting it in a freezing mixture of ice and salt; (*b*) it was stated that copper and sulphate ions do not exist in a copper sulphate solution until a current is passing.—K. G. EMELEUS.

CHEMISTRY.—*Part I. Theory.*—The paper set was higher than matriculation standard, and included questions relating to borax, ammonia, phosphoric acid, and hydrochloric acid. The weakness of the answers to such well-known and important questions gave a very bad impression of the candidates' knowledge of the course as laid down in the syllabus.

Part I. Practical.—This paper contained one qualitative question and one quantitative. The detection of basic and acidic radicles (qualitative) was done fairly well, but the simple quantitative estimation of hydrochloric acid was not performed with sufficient accuracy. Of the 58 candidates examined 37 failed to come up to a satisfactory standard.

Part II. Theory.—The questions were on the whole very well answered. Of the 39 candidates examined only 15 failed to show a satisfactory knowledge of organic chemistry. The one question on inorganic chemistry was, however, very badly answered. Taking everything into consideration, the standard of knowledge was satisfactory.

Part II. Practical.—The work performed in this part of the examination was good. Of the 39 candidates examined, 21 handed in excellent results, whilst 7 other candidates showed sufficient capacity for accurate work to merit a pass; 11 candidates failed to reach a satisfactory standard. During the past six years there has been a considerable improvement in the quality of the work done in the Part II examination. The method of maintaining a high standard in the examination has at times seemed drastic, but has performed the useful work of encouraging more thorough tuition of the student.—H. GRAHAM.

BOTANY.—The proportion of candidates reaching pass standard in the theoretical part of the examination was larger than usual, but in the practical there was a great deal of slovenly work with telescope objectives and eyepieces in evidence as pocket lenses and safety razor blades without holders for section-cutting. The results on the answer papers corresponded with the methods. Only one out of eleven knew a sunflower fruit, and only nine out of twenty gave a reasonably accurate description of the maize fruit with soaked material available for examination. The identification of the material to be sectioned appeared to depend largely on guessing, and this was accompanied by memorised sketches of tissues from the sunflower stem, which was not given as material in any case.

PHARMACOGNOSY.—The answers to the theoretical paper showed a reasonable acquaintance with the contents of the syllabus, although there were some outstanding cases of apparent ignorance of the pharmacopœial requirements. The weakest part of the practical work was the microscopy of the starches and pulverata, but in this section also there were obvious signs of a lack of preparation on the part of some candidates. With only three subjects in Final Part II, there is no reason why any candidate should come up almost unprepared in any one of his or her subjects.—JAMES SMALL.

PHARMACY AND PRACTICAL PHARMACY.—The candidates who presented themselves (both referred and new) showed a decided improvement in all sections of the examination, written, oral and practical. The tendency to overload answers given to forensic pharmacy still exists to a small extent; answers to questions in the theory of pharmacy and B.P. sections were much more concise and accurate. The practical work handed in was superior to that of many previous examinations; accuracy in reading the prescriptions and correct labelling of the medicines showed a marked improvement. While several reached round about 70 per cent. in sections of the subject, their general average was lower in others, so that no high totals were attained which might have enabled some to reach "medal marks." Nevertheless, the upward tendency was most gratifying.—THEOPHILUS HARPER.

BUSINESS METHODS.—I examined 43 candidates in the subject of business methods at the examination held in December 1936. I have already supplied you with a detailed schedule of the results of my marking, and the following is a summary:—

Total possible marks	4,300
Total obtained	2,432
Percentage obtained	56.6

I recommend that 34 candidates be awarded a pass in this subject.—G. B. HARRIS.

THE PRESIDENT thought they had reason to be satisfied that the quality of the candidates was improving. Botany still seemed to be the weak spot. On the whole they could congratulate themselves and hope they would be able to turn out capable pharmacists in future.

A QUESTION OF FINANCE

MR. MCGREGOR moved: "That THE CHEMIST AND DRUGGIST be presented without charge to all members and associates in good standing."

MR. MCDOWELL seconded.

PROFESSOR SMALL proposed as an amendment to delete "in good standing" and add "who send with their annual subscription a request to this effect in writing to the Secretary of the Society."

MR. GRAY seconded the amendment.

MR. ABERNETHY said the overhead charges of chemists and druggists were far too high. If they got a rebate of 10s. 6d. from the Society it would cost less, however, than Mr. McGregor's proposal. They were beginning at the wrong end.

MR. MCGREGOR said Stormont had told them they could not reduce the three-guinea licence, but they had also been told there was nothing to prevent the Society giving part of it back to the members.

MR. FORREST said lots of chemists did not want the journal for nothing; they were prepared to pay for it.

DR. ACHESON said he had been reading THE CHEMIST AND DRUGGIST since 1882.

After further discussion both the resolution and the amendment were referred to the Finance Committee, together with a suggestion from Mr. Abernethy that portion of the licence be handed back.

OTHER BUSINESS

MR. FORREST moved that the hour of the monthly meeting be altered to 2.30 p.m. or other such hour most suitable to the majority of the Council. He said he made the proposal in the interest of the country members. After a brief discussion the motion was withdrawn.

Mr. George Holmes, Holmlea, Antrim, was elected a student of the Society, and the following nominated candidates were elected members of the Society:—Francis Haire Richardson, 299 Oldpark Road, Belfast; Robert Maxwell, 180 Connsbrook Avenue, Belfast; David Baird, 136 Sandy Row, Belfast.

MR. GRAY brought up the question of the Commission in London regarding patent medicines, which it was possible, he said, might affect them so far as stamp duty was concerned.

THE PRESIDENT said he did not know it could affect Northern Ireland. It would be contrary to the Act of Union.

On the motion of MR. TATE, seconded by MR. ABERNETHY, it was agreed to send a letter of sympathy to the family of Mr. R. W. McKnight, Ph.C., who had passed away.

Presentation of Certificates

At the January meeting of the Council the certificates awarded to the successful candidates at the final examinations in December were presented to the following:—T. Finegan, Miss N. M. Hay, C. Holmes, J. J. Huey, W. J. Kennedy, S. Magowan, Miss C. E. Nesbitt, S. Orr, and J. A. Swenarton.

THE PRESIDENT said they were pleased to see so many of the future members of the trade present to receive their certificates. He wished them every success in their careers. He was glad to say the reports of the examiners received that day at the Council had been very creditable to those concerned.

The licentiates were afterwards entertained to tea. Several of the successful candidates were unable to be present.

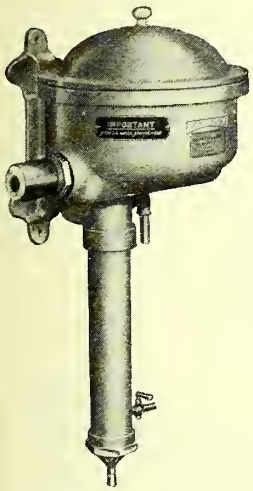
Hawking of Medicaments in France

A FRENCH enactment of recent date relating to the hawking of medicaments and pharmaceutical products ("Bulletin de Pharmacie du Sud-Est," 10, 1936) has a much wider application than its title suggests. It prohibits not only hawking, but also the sale of medicaments outside the pharmacy and of medicinal plants outside the pharmacy or herbalist's shop. There are three distinct provisions in the Act. First, the sale to the public of medicaments or products possessing therapeutic or prophylactic properties in any public place, in private houses, or in any shops other than pharmacies, is strictly forbidden. Second, the sale of medicinal plants, mixed or simple, in any of the places mentioned, or in herbalists' shops, is prohibited. Third, it is illegal for pharmacists or herbalists to canvass the public for orders, either by representatives or agents or through order offices of a commercial character; to trade by such means; or to maintain regular and organised services to deliver goods ordered by such means.

FASHIONS IN MEDICINE.—"In the last quarter of a century we have witnessed the therapeutic vaccine craze based, not on experiment and the vast experience of war-time as in the case of Wright's prophylactic antityphoid vaccine, but on haphazard speculation and ill-considered enterprise. Organisms isolated from the throat, dental sockets, stools, and elsewhere, and hailed as the cause of the rheumatism, the catarrh, the colitis (and sometimes of the undiagnosed anæmia, cancer, tuberculosis, or gout) have been injected in various combination in their millions of millions—the prescription being at last discontinued when it had failed or the patient, after months or years, got better in spite of it. The polypharmacy of the Middle Ages was no more absurd. 'Endocrines,' 'rays,' exploitations of surgical procedure, injections of chemical substances vaunted to cure influenza and pneumonia, intravenous chemotherapy for septicæmia, have all been allowed to have their day."—Dr. John A. Ryle ("The British Medical Journal," 3960, 1067).

Notes on Machinery

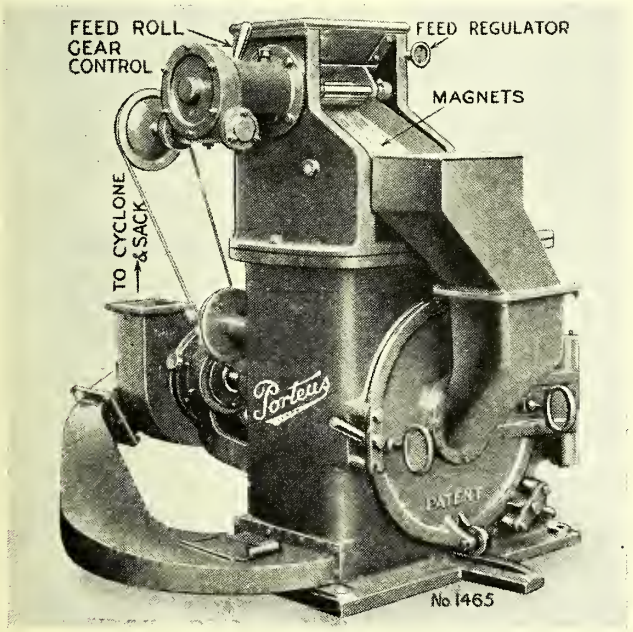
Q.P. Emulsifier.—Ormerod Engineers, Ltd., Healey Works, Shawclough, Rochdale, direct attention to their Q.P. emulsifiers, of which there are two models: one designed especially for laboratory use and an electrically driven model for production purposes. The laboratory model is hand operated, and it is specially suggested for use in making up experimental emulsions or for testing materials.



Electric water still.—Manesty Machines, Ltd., Manesty Buildings, College Lane, Liverpool, 1, have recently introduced a modification of the well-known Manesty "O" water still, gas heated, in a similar still which is heated by electricity. This new still has a small current consumption using approximately 1½ units per hour, and can safely be left to run day and night. It is automatic in action, strongly built and can be mounted on the wall by means of a bracket, which can be supplied, without sacrificing available floor space. The distilled water produced is free from dissolved gases and has a higher quality than that required by the British Pharmacopœia, 1932. The capacity is three pints per hour, and larger sizes are available.

Stainless steel.—S. Fox & Co., Ltd., Stocksbridge, near Sheffield, remind manufacturers of the Silver Fox new process stainless steel, which it is claimed has particular advantages in the preparation of fine chemicals. Inquirers are invited to write for catalogue S.F.157.

Atlas mixers and sifters.—George Porteus & Sons (Leeds), Ltd., Leeds Bridge, Leeds, specialise in automatic spraying and grinding plant, and state that their new mixing machines have a unique interior construction. All types of



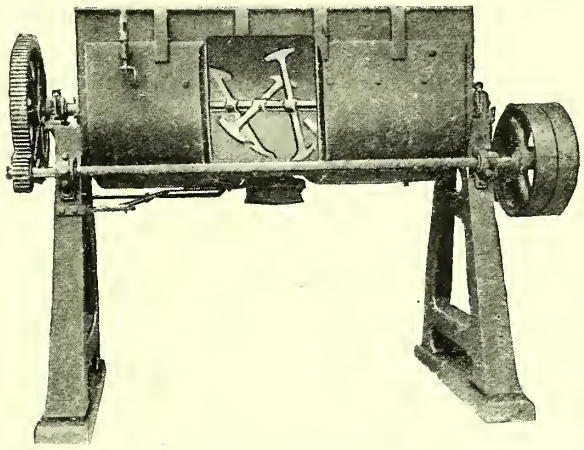
machines are produced by this company, and their expert knowledge is available to inquirers. An interesting introduction is a new sifter and mixer which enables the exact amount of perfume to be added in each mixing.

Premier Colloid Mills, Ltd., Prince Regent's Wharf, Silvertown, London, E.16, invite manufacturers to send ingredients and as much information as possible regarding the final results required. They offer to solve problems which arise in manufacturing processes.

Tablet machines.—Rotary and single punch types are offered by S. W. Wilkinson & Co., Western Road, Leicester, specialists in pharmaceutical and chemical machinery. They are also advertising in this issue a super speedy mill which is a combined mixer and grinder and is used in the production of ointments, tooth paste, foods, and so forth.

Packing machines.—J. G. Jackson & Crockatt, Ltd., Darnley Street, Glasgow, S.1, direct attention to the Jackson-Crockatt patent packing machines for all powder materials. Details are given elsewhere in this issue to the packing machine described as "Junior 45," which is easily dismantled for cleaning, and is intended for packing to uniform density, face and toilet powders, digestive powders, etc.

Mixing machines for ointments, pastes, powders and liquids are advertised in this issue by W. Rowlandson & Co.,



75 Mark Lane, London, E.C.2, who invite inquiries for special equipment. This firm issues grinders, sifters and other machines, which are detailed in our advertisement pages.

Pharmaceutical machinery of all kinds, including pill and tablet machines, compact powder presses, suppository and lipstick moulds, sifters and mixers, etc., is offered by J. W. Pindar & Co., Drakefell Road, Endwell Road, Brockley, London, S.E.4.

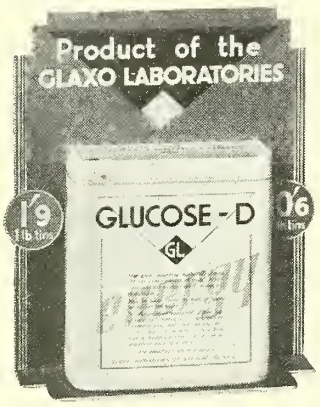
Mixers, presses and plant for the chemical and associated industries are offered by A. Barton (Engineers), Ltd., Providence Foundry, St. Helens. Inquiries are also invited for steam-jacketed pans. Iron and brass castings and welded equipment for chemical plant are obtainable from this company either in the rough or machined.

Hy-speed equipment is advertised in this issue by Butlers (London), Ltd., 62-63 Minories, London, E.C.2, and attention is directed to their filter, asbestos disc filter, glass-lined tanks and mixer. A catalogue and full details are supplied on application. Hy-Speed equipment has the advantage of ready portability; there are no installation costs, pipe lines or starting boxes, and it operates from ordinary electric light socket.

Filling machines.—L. T. Lauder, 46 St. Martin's Avenue, Leeds, 7, directs attention to the Lauder filling machines which, it is claimed, reduce costs. The Lauder filling nozzle is strongly made in gun-metal, chromium-plated, and is worked by hand grip. Another machine of interest is the filling machine, which is made of stainless steel with a steel base. This machine is made in 2, 5 and 10 gallon capacity. Both these machines are easily cleaned. Full particulars of all types of filling machines will be sent on application.

Trade Notes

GLUCOSE D.—Glaxo Laboratories, Ltd., Greenford, Middlesex, have issued a showcard, illustrated herewith, referring to the utility of Glucose D. This showcard, which is in colour, carries an enlarged replica of the pack and should be a useful counter or window display adjunct. The January edition of the "G.L." (Glaxo Laboratories journal for retail chemists) is now published, and copies may be had on application.



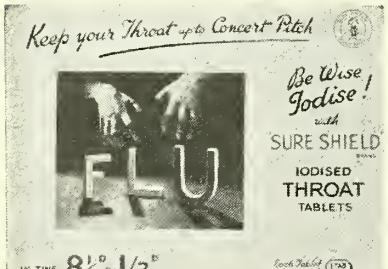
ADDITIONS TO PRICE LIST.—In the January issue of their quarterly price list, May & Baker, Ltd., Dagenham, have added a perfumery section relating to the products which the perfumery department is able to offer. These include synthetics, isolates and special bases which are available at competitive prices. Inquiries for specimens and quotations are invited. The other section of the price list deal with chemicals and pharmaceutical specialities issued by them.

SHOPS ACTS, 1912-34.—The attention of chemists is directed to the advertisement in this issue relating to the card issued by THE CHEMIST AND DRUGGIST in connexion with the Shops Acts. The cards are printed on stout board and are plainly legible. They may be obtained from the Publisher, THE CHEMIST AND DRUGGIST, 28 Essex Street, London, W.C.2, post free 1s. each or three cards 2s. 9d.

PAPER HANDKERCHIEFS.—Kleenex tissue handkerchief, which is a nationally advertised product, is offered to chemists on advantageous terms. Orders may be placed through the usual wholesalers. Kleenex handkerchiefs are issued by Cellucotton Products, Ltd., 317 High Holborn, London, W.C.1. Elsewhere in this issue details are given in regard to the value of these products from an hygienic as well as an economical point of view.

ATTRACTIVE BONUS OFFER.—Thomas Hedley & Co., Ltd., Phœnix Buildings, Collingwood Street, Newcastle-on-Tyne, announce the commencement of an intensive advertising scheme in favour of Drene, the new liquid soapless shampoo. The offer closes on February 1, and orders placed before this date qualify for display bonus terms, details of which may be obtained on application. The "Daily Mail" carried a front-page advertisement on January 22. Three sizes of Drene shampoo are available.

INFLUENZA.—Thos. Guest & Co., Ltd., Carruthers Street, Ancoats, Manchester, 4, have issued a showcard which is especially topical at the present time in view of the influenza epidemic. This showcard is issued to promote the sales of Sure Shield iodised tablets, and a specimen copy will be sent to any chemist on application for display purposes.



ADVERTISING CAMPAIGN.—H. R. Napp, Ltd., 3 and 4 Clement's Inn, Kingsway, London, W.C.2, inform us that they are now engaged in an active campaign to the medical profession in respect of their products Sedonan and Normacol. It is suggested that chemists may wish to consider their stocks of these products in view of this.

BOTTLE CLEANING.—The Thomas Hill Engineering Co. (Hull), Ltd., 9 Park Lane, Stepney, Hull, offer free on application Hill's blue book No. 50, which it is stated is of special interest to all engaged in the bottling industry.

LABORATORY EQUIPMENT.—In the modern laboratory an efficient analytical balance is essential, and inquiries are invited by William A. Webb, Ltd., 4 and 5 Skinner Street, London, E.C.1, for instruments intended to be used in special purposes. Balances issued by this company are guaranteed for accuracy, sensitivity and durability. Further details are given in this issue.

WINDOW DISPLAY COMPETITION.—A Brand's essence window display competition is advertised in this issue. Prizes totalling £270, the first prize being £50, with awards in specified areas of £20 each are offered, and there are fifty consolation prizes of two guineas each. In addition, a hamper of Brand's delicacies are offered to every entrant. Brand's essence display material will be supplied free from Brand & Co., Ltd., 84 South Lambeth Road, London, S.W.8.

HOT WATER BOTTLE COVERS.—C. J. Hewlett & Son, Ltd., 35 to 42 Charlotte Street, London, E.C.2, are offering an attractive showcard illustrating the Charlotte covers for hot water bottles with every order of one dozen. The showcard is printed in colour and embossed to illustrate the two varieties: corduroy and velour. A leaflet giving particulars of prices and the sizes and colours available are obtainable on application.

ESSENTIAL OILS AGENCY.—Burgoyne, Burbidges & Co., Ltd., London, E.6, have been granted the sole importing and distributing rights of the Green Anchor products of L. Russo & Figlio, Messina. Inquiries are invited for essential oils of lemon, bergamot, orange and tangerine, and Messrs. Burgoyne hold stocks.

CORONATION DISPLAYS.—J. C. King, Ltd., 42 Goswell Road, London, E.C.1, have issued a handsome twenty-page booklet of show matter and decorations for the coronation celebrations. The booklet is fully illustrated in coronation colours, with extra gilt and silver workings giving an accurate impression of the items described; it will be sent free on request.

Trade-Mark Applications

The figures in parentheses refer to the classes in which the marks are grouped. A list of classes and particulars as to registration are given in "The Chemist and Druggist Diary and Year-Book," 1937, p. 338.

(From "The Trade Marks Journal," January 6, 1937.)

"VERPINE"; for disinfectants and disinfecting soap (2). By C. G. Fox & Co., Ltd., 61 St. Mary Axe, London, E.C.3. 570,996. (Associated.)

"ARISTOC"; for disinfectants (2). By Aristoc, Ltd., North Street, Langley Mill, Notts. 567,697. (Associated.)

"PINEIOL"; for sanitary chemicals (2). By Morris, Little & Son, Ltd., 150 Southampton Row, London, W.C.1. 571,723. (Associated.)

"CLAREBO"; for disinfectant soap (2). By Wessex Supplies, Ltd., Market Place, Wells, Somerset. 572,235.

"ELKOL"; for sanitary chemicals (2). By The "Sanitas" Co., Ltd., 51 Clapham Road, London, S.W.9. 572,422.

Device of fabric embodying the word "Uri-Klenz" (disclaimed); for medicines for human use (3). By G. A. Armitage, Botanic & Dietetic Clinic, Grosvenor House, S. Norwood, London, S.E. 25. 572,120.

Marriages

BLOCKSIDGE—TANNER.—At Christ Church, Luton, Chatham, on December 26, 1936, Frank Thomas Blocksidge, M.P.S., to Edith Tanner.

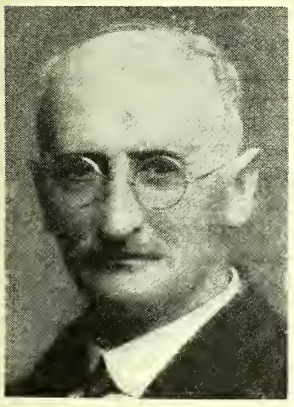
GREATOREX—BERRY.—At Newark Parish Church, on January 14, John Greatorex, M.P.S., to Diana Berry.

HOULISTON—HUCKLEBRIDGE.—At St. John's Parish Church, Needham Market, Suffolk, on January 19, John S. Houliston, M.P.S., to Mary E. R. Hucklebridge.

Deaths

CARNEY.—At St. Vincent's Nursing Home, Dublin, on January 15, Mr. Valentine Carney, R.D., 5 Terenure Road, East Rathgar, second son of Mr. Valentine Carney, L.P.S.I., Maynooth, and brother of Mr. Stephen J. Carney, L.P.S.I., Maynooth. Mr. Carney, who was registered in 1930, was a well-known figure in pharmacy and in the sporting life of the country. His widow and the members of the family have received many messages of condolence. There was a large attendance of pharmacists and others at the funeral, including Messrs. P. A. Brady, Brendan Smith, A. D. Davidson (May Roberts & Co.), A. Hughes (A. de St. Dalmas & Co.), J. Blackwell (Boileau & Boyd, Ltd.), A. F. Collins, J. Gleeson, F. J. Flanagan, Miss Mona Collins, Messrs. S. T. Smith, Eugene MacMahon, John Bennett, C. J. Staunton, P. C. Crowley, A. Hanna, L. C. Clarke, P. Usher, J. Nugent and M. Usher.

ELLIS.—At his residence, 65 Douglas Park Avenue, Bearsden, Glasgow, on January 16, Professor David Ellis, D.Sc., Ph.D., F.R.S.E., Professor of Bacteriology and Superintendent of the School of Pharmacy at the Royal Technical College, aged sixty-two. Professor Ellis obtained the B.Sc. of London University in 1896. For four years he taught science in secondary schools in Wales and Yorkshire, thereafter going to Marburg University, Germany, where he received the Ph.D. degree in 1902. Returning to Scotland, he taught in Dollar Academy till 1904, in which year he was appointed Lecturer in Botany and Bacteriology in the Royal Technical College, Glasgow. His researches in botany brought him the D.Sc. degree of London in 1905; twelve years ago he was appointed Professor of Bacteriology in the Glasgow Technical College, acting also as Superintendent of the Pharmacy School. Professor Ellis was recognised as an international authority on sulphur and iron bacteria. He was an expert on sewage disposal, and was consulted by the Department of Health for Scotland. He also contributed numerous articles to scientific journals. Professor Ellis's wife died nine weeks ago; he is survived by two sons.



Photo] [*Elliott & Fry*
PROFESSOR D. ELLIS, D.Sc., PH.D.

JAMISON.—At Knock, Belfast, on January 13, Mrs. Jamison, widow of Mr. William Jamison (Shaw & Jamison, Ltd., wholesale druggists). Mrs. Jamison was mother of Mr. R. A. Jamison, Ph.C.

MARTENS.—At Frankfurt, on January 16, Mr. Erwin Gustav Martens, managing director of Genatosan, Ltd., Loughborough, and of the Anglo-Continental Guano Works, Ltd., London, E.C.3, aged fifty-nine.

TRIMMING.—In a Bournemouth nursing home, recently, Mr. A. P. Trimming, chairman of Trimming & Co., Ltd., chemists, Alton and branches, aged fifty-nine.

WOOLLONS.—At her home in Chevening Road, London, N.W.6, on January 18, Louisa Woollons, widow of the late Mr. Charles H. F. Woollons, M.P.S., and mother of Mr. Charles B. Woollons, M.P.S., 28 Kilburn Lane, W.10, aged seventy-eight.

Personalities

MR. J. H. HODGKISON, M.P.S., has joined the staff of D. Mawdsley & Co,. 2-6 Riga Street, Hanover Street, Shudehill, Manchester, 4, as representative.

MR. WALTER R. CROWE, one of the senior executives of the London Press Exchange, Ltd., has been appointed to the boards of Universal Chemical Holdings, Ltd., Steradent, Ltd., and Don S. Momand, Ltd., and he is to take up his new duties on February 1. Mr. Crowe, who has been with the L.P.E. for over ten years, has been actively associated with many of their important clients, particularly those who marketed their products through the pharmaceutical channels.

MR. WALTER R. CROWE

MR. J. A. JOHNSTONE, Wallingford, has been appointed the representative of the local town council on the North Berks Regional Planning Committee.

MR. HUGO WOLFF has removed to 187 Oakwood Court, Kensington, W.14. (Telephone: Western 6194.)

FRIENDS and the staff of Bob Martin, Ltd., Southport, were guests of Mr. Bob Martin at a dinner and dance at the Palace Hotel, Birkdale, on January 15 in celebration of his seventieth birthday. At midnight he was presented with a silver salver, weighing over 100 oz., the gift of the staff, together with an illuminated address on vellum bound in leather. On the previous evening the annual works social had been held, when Mr. Martin had been presented with a silver fruit bowl and servers and another illuminated address.

Business Changes

HOWARDS & SONS, LTD., Ilford, Essex, have had their telephone number changed to Ilford 3333.

THE street number of Wallas & Co., chemists, New Cavendish Street, London, W.1, has been changed to 45.

TAYLORS DRUG CO., LTD., have opened a new branch at 147 St. John's Road, Corstorphine, Edinburgh.

MR. H. R. URQUHART, chemist and druggist, 43 High Street, Peebles, has acquired the pharmacy at East End, Walkerburn.

MR. HAWTHORN STEWART, chemist and druggist, 46 High Street, Paisley, has acquired the business of Mr. Cyril G. Forster, chemist and druggist, at 75B Glasgow Road.

Coming Events

This section is reserved for advanced notices of meetings or other events. These should be received by Wednesday of the week before the meetings, etc., occur.

Tuesday, January 26

Thames Valley District Pharmacists' Association and Branch, Three Fishes Hotel, Kingston-on-Thames, at 8.45 p.m. Mr. H. N. Linstead (registrar, Pharmaceutical Society) on "Medicine Stamp Duty and Other Topical Questions."

Wednesday, January 27

Pharmaceutical Society, Tees-side Branch, Cleveland Technical and Scientific Institute, Corporation Road, Middlesbrough, at 8.15 p.m. Mr. H. M. Hirst (a member of the Society's Council) on "The Duties of a Pharmaceutical Councillor."

West Middlesex Chemists' Association and Branch, Connaught Rooms, Great Queen Street, London, W.C.2, at 6.30 for 7 p.m. Annual dinner and dance. Tickets 12s. 6d.

Thursday, January 28

Manchester Pharmaceutical Association and Branch, Victoria Hotel, Manchester, at 8.30 p.m. "Ten-Minute Papers" by members.

Photographic Dealers' Association, Glasgow and West of Scotland Branch, Ca'Doro Restaurant, 122 Union Street, Glasgow, C.2, at 7.45 p.m. Mr. J. E. Saunders, F.Z.S., on "The Joy of Amateur Cinematography."

Information Department

INFORMATION WANTED

Postal or telephone information with respect to makers or first-hand suppliers of the undermentioned articles will be appreciated.

S/20. Begano cachets
E/19. D.M. Formula (ointment)
E/19. Du-Mu plasters
E/19. Hartley's Killpain
M/14. Locoids
W/14. Methaform
H/20. Pectoral Australian cough mixture
E/19. Queen of Egypt face powder
E/19. Ridoworm
A/14. Sozodont (present London source)

THE
CHEMIST AND DRUGGIST

VOL. CXXVI. January 23, 1937 NO. 2972

Plant and Power

In this issue we deal with certain problems of manufacture. Manufacturing problems from the pharmaceutical and chemical points of view have been grouped under three headings: process, plant and power. The particular processes with which we have chosen to deal in this issue are the grinding, sifting and mixing of powdered drugs. An article on this subject by an authority describes modern tendencies, with particular references to types of sifter adapted to various purposes. A point worthy of note by buyers of machinery is that certain manufacturers offer facilities in their own testing departments for finding the best methods of grinding and sifting by practical experiment. It is safe to assert that in this branch of machine design the British manufacturers are in the forefront for experience, technical skill and adaptability. The pharmaceutical manufacturer who calls the machine maker into conference before adding to his plant is therefore making a wise move. The article dealing with this subject is accompanied by illustrations and descriptive details. It is followed by accounts of visits to works in which machinery of this nature is manufactured.

Wherever machinery is installed the further question of power production is of paramount importance. The manufacturer must carry out his process as efficiently and at the same time as economically as possible. The question arises as to whether steam, gas, electricity, oil or some other motive will give best results in his own undertaking. Often he may find it difficult, through lack of information, to assess the value of methods other than the one he has been using. This deficiency we have attempted to make good by including an article on the relative merits of various methods of power production. The subject is, of course, intimately bound up with methods of transmitting the power, and one such system is discussed in the article dealing with machinery belting, which classifies the materials commonly used and suggests occasions upon which each is most effective. On another page are given abstracts of papers given before the Chemical Engineering Group of the Society of Chemical Industry on automatic regulators in industry. It is emphasised that all modern apparatus should be designed to accommodate instruments of measurement, which cannot fairly be expected to function accurately when inserted into machines as an afterthought.

From automatic regulators it is but a step to another increasingly important factor in economical production, air conditioning. Manufacturing pharmacy, in which a system of atmosphere control is believed to have been adopted first in industry, seems to offer one of the most fertile fields in which it can be turned to still further and more profitable account. Another subject to which manufacturers handling drugs and chemicals have to give particular attention is the metal used in machinery and containers. In a corresponding issue last year we dealt with the properties and applications of stainless steel; and the subject is extended in the present number by articles on two other metals, tin and copper. In this age of the machine it is satisfactory to note that engineers are directing their attention to the needs of the small manufacturer. For the small man of to-day, with due encouragement, is reasonably likely to become the large-scale producer of to-morrow.

Last Year's Trade

We have compiled a brief review of our international trade for 1936 (p. 116) in all classes of merchandise and similar information on the class of goods designated "Chemicals, Drugs, Dyes and Colours." For the purpose of comparison, we have appended corresponding figures for the two previous years. It will be seen that the aggregate of our international trade continues to increase, and this steady upward movement is principally due to a further big jump in the value of imports. The improvement in the total value of our exports (including re-exports) is an achievement under present world conditions, but it by no means balances our much greater purchases. The result is that our debit trade balance has reached the highest level ever recorded in normal times at £347,800,750 for 1936, compared with £275,750,000 in 1935. Of our total world trade in 1936, imports represented nearly two-thirds of the value and exports slightly more than one-third. On this subject of our ill-balanced trade, it is of interest to note that the amount of duty collected under the Import Duties Act, 1932, continues to increase, the total of revenue for 1936 being £28,400,500, compared with £25,000,000 in 1934. Similarly, the total amount collected under all duties by Customs on all classes of merchandise was £15,000,000 more in 1936 than in 1935. These figures suggest there has been a small increase in the arrivals of dutiable goods; it is also a fair indication that the major portion of the £92,000,000 increase in our overseas purchases during 1936 was due to the greater tonnage of goods consigned from Empire sources and landed free of duty in this country.

The final figures for 1936 of the "Chemicals, etc." group show a steady increase in the value of our imports, a matter of £1,200,000 during the past two years; during that period key industry duty increased by approximately £186,000, evidence that the value of dutiable "fine chemicals" landed here in 1936 was roughly £558,000 more than in 1934. Our exports of home manufacture of these classes of goods to Empire destinations show an excess of only £341,000 in 1936, compared with the 1934 figures, while our shipments to foreign countries during the same period increased by over £1,200,000. These figures are of interest in view of the forthcoming review of the Ottawa Trade Agreements. On balance the chemical trade continues to show a good credit, but here again, while the grand total of inwards and outwards traffic continues to expand, by far the larger portion of the increase is due to greater imports, resulting in a contraction of the balance in our favour of about £76,000 compared with the 1935 result.

The Alkaloidal Content of Hydrastis

By W. A. N. Markwell

ONE aspect of the effect of cultivation methods upon hydrastis which was not mentioned in the article "Hydrastis: Wild and Cultivated" (*C. & D.*, January 16, p. 65) is that of the alkaloidal content of the commercial drug. During the last decade, hydrastis appears to have steadily deteriorated in this respect, as shown by the following figures obtained in this laboratory. The figures represent the minimum and maximum percentages of alkaloids found in all the samples examined during the year. The results were obtained by the United States Pharmacopœia X method of assay:—

Year	Lowest	Highest
1927	3·02	3·12
1928	2·71	3·53
1929	2·46	2·74
1930	2·55	2·72
1931	2·37	2·88
1932	2·23	2·62
1933	2·30	2·48
1936	1·74	2·59

It is interesting to note that in 1927 the price was approximately 27s. per lb., whereas present-day prices range about 13s. per lb.

A point to be borne in mind regarding the alkaloidal content of hydrastis is that as a rule the figure upon which it is sold is based upon the U.S.P. X method of assay. This consists of determining the total ether-soluble alkaloids. The method gives results which are not comparable with those obtained when the drug is exhausted with alcohol, the percolate evaporated to form a fluid extract, and then assayed by the process of the B.P., 1914, now incorporated in the B.P.C., 1934. The following are some figures obtained upon two samples which illustrate this point:—

Sample	Year	B.P. 1914 (now B.P.C.) Method	U.S.P. X Method	D.A.B. VI Method
1	1931	2·56	2·73	—
2	1936	1·34 (1·20)	1·74 (1·61)	2·5 (1·80)

The figures in brackets represent the percentages obtained by titration of the alkaloidal residues, calculated as hydrastine and using the factor given in the Deutsches Arzneibuch.

Pulvis Hydrastidis, I.A., should contain not less than 2 per cent. of hydrastine, but no method of assay is indicated, this being another example of the futility of setting alkaloidal standards without prescribing the particular assay process to be employed. The Poisons Rules, 1935, provided the most recent example of this. Should hydrastis ever recover its former popularity it would be desirable that some agreement be made regarding its assay, and perhaps a new process evolved, which would prevent such anomalous position as exists at present. The figures included in this note were obtained in the analytical laboratory of Potter & Clarke, Ltd., and I have to thank the directors for permission to publish them.

A Notable Lecture

UNDER the title "A Chapter in the Chemistry of Essential Oils." Professor John Read recently delivered the 1936 Streatfeild memorial lecture at the Institute of Chemistry. His lecture is one of the most interesting of the series of which this is the nineteenth. Read and menthol are, of course, inseparable; aud, as one would expect, menthol looms large throughout the lecture, which, after a preliminary skirmish on college memories, commences with the following statements: "At dawn on April 20, 1770, Lieutenant Hicks, on board Cook's ship, the 'Endeavour,' obtained the first glimpse on record of the eastern coast of Australia"; and "The great quantity of new plants, etc., Mr. Banks and Dr. Solander collected in this place occasioned my giving it the name of Botany Bay." In 1788 a letter was received by Sir Joseph Banks from Surgeon Consiclen, in which he wrote: "We have a large peppermint tree which is equal, if not superior, to our English peppermint."

Sydney Peppermint

This tree is known to-day as *Eucalyptus piperita*, or the Sydney peppermint. In 1900 the peppermint odour of the essential oil has shewn to be due to the ketone piperitone—and at this point the Australian chemist H. G. Smith is brought into the picture. Born at Littlebourne, near Canterbury, he published his first contribution to organic chemistry, a paper on the kinos of the eucalyptus, in collaboration with J. H. Maiden. His succeeding researches, until his retirement from Government service, were carried out in close collaboration with his botanical colleague R. T. Baker. A good deal of interesting detail on the work of Baker and Smith was given by Professor Read, and then the connexion with piperitone follows.

Although piperitone from eucalyptus oil is strongly lævo-rotatory, it is easily racemised by heating to 180°, and derivatives prepared from the optically active ketone are often optically inactive. Smith and Penfold shewed that lævo-piperitone, on hydrogenation at 180°, yielded an optically inactive menthone, which on further reduction yielded some *d l*-menthol melting at 34°. Simonsen then discovered piperitone in the essential oil of *Andropogon Jwarancusa*, but it was dextro-rotatory. The relationships between piperitone, the piperitols, geraniol and phelladrene are described, which leads up to the relationship of the menthols to piperitone and their derivation therefrom. There are four families of menthols, each containing a dextro-variety (*d*), a lævo-variety (*l*-) and an optically inactive, or externally compensated variety (*d l*-). The careful reduction of optically active piperitone leads to mixtures of optically active menthones and menthols. It is a striking fact that lævo-piperitone can be converted under suitable conditions by direct hydrogenation into any one of the eight possible optically active menthols. Much of the valuable work in converting piperitone into menthol was done by Blagden and Huggett in the laboratories of Howards & Sons, Ltd., of Ilford. Commercial synthetic menthol consists chiefly of *d l*-menthol, the optically inactive, externally compensated form of menthol, and melts at about 30°, whereas peppermint menthol, *l*-menthol melts at 42°-43°.

An Epilogue

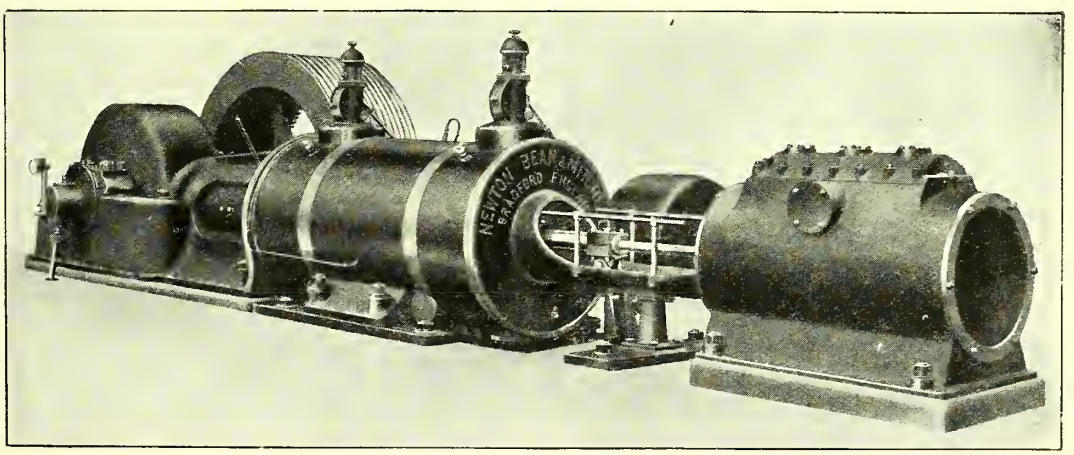
The lecturer concluded his interesting chapter in the chemistry of essential oils with an epilogue. "The eastern coast of Australia was first sighted at dawn on April 20, 1770; the last of the menthols, in a stereo-chemically pure condition, first came to light in the St. Andrew's laboratories on Christmas Day, 1933. So we began, and so let us end our 'Chapter in the Chemistry of Essential Oils' . . . The test tube and the polarimeter, the publications of the learned societies, our Beilsteins and our Mellors, are the tools of our craft; but let us remember that we are citizens of a wider world. Let us stand back sometimes from our laboratory benches and contemplate the results of our own and our colleagues' researches against the wider background of our science and our world." Truly a notable lecture.

Production and Utilisation of Power

THE great diversity of products now made by manufacturing chemists continually brings the question of the economical use of power to the fore. The manufacturer may, or may not, require process steam ; it may be more economical to use gas or electricity for heating purposes. Even with the advent of the now widespread grid scheme for the supply of cheap electricity it may still pay him to produce his own current. Much depends upon the locality in which his factory is situated. For mechanical power he has to decide whether this shall come from motors—working either from his own electrical generator, or from an outside supply—or whether he will possess his own prime movers, such as steam engines, steam turbines, or internal combustion engines. No hard and fast rule can be universally applied to the solution of these problems, because what is efficient and economical in one factory would be entirely unsuited to another, even though the latter is making the same products but in a different locality.

Steam Power Plants

So far as Great Britain is concerned the predominant fuel for steam raising is coal. In general oil fuel is more costly, and only in exceptional cases or in abnormal times do manufacturers make extensive use of it. In selecting a boiler for a specific purpose the question of steam pressure desired and kind of coal obtainable most cheaply and abundantly must be considered. It is commonly acknowledged that pulverised fuel gives increased efficiency in a boiler, but against this must be set the expense of pulverising. For factories wherein the demand for steam is more or less constant day and night, Lancashire, Cornish, and Galloway boilers are largely in use ; but where steam requirements fluctuate widely and the demand is only intermittent water tube boilers are sometimes installed. Where superheated steam is necessary to the factory the superheater installed should always be the most suitable for the type of boiler in use. A superheater with unprotected tubes should have 14 to 16 square feet of heating surface per boiler h.p., which surface should be increased by about 30 per cent. for protected tubes. The efficiency of a boiler using slack coal generally lies between 70 per cent. and 80 per cent.; pulverised coal raises this by a few per cent.; while oil-fired boilers have efficiencies up to 90 per cent. The difference between this percentage and 100 represents heat losses. Of such losses heat escaping with the flue gases is the biggest item, and in out-of-date installations this may be as high as 20 per cent. In modern plants such waste is minimised by utilising the hot flue gases to heat the boiler feed water, or for other heating purposes. Other losses on the boiler installation are losses by radiation, which can be appreciably reduced by suitably insulating the boiler; and through incomplete combustion, caused often through bad stoking or an insufficiency of air. On the other hand a large excess of air cools the furnace unduly, causing loss of heat. In practice the amount of air blown into the furnace depends on the type of stoking as also upon the furnace design. An average is 40 to 60 per cent. of air over the amount required theoretically to effect complete combustion of the fuel. Frequent tests for the amount of carbon dioxide in the flue gases affords a good indication of furnace efficiency. For this purpose a carbon dioxide meter, to show the amount of CO_2 present at any particular time, is a great asset. Although this test alone is not a sufficient criterion of furnace efficiency, flue gas temperature must be taken into consideration and flue gas temperature must be taken into consideration and use of oil-fired boilers is distinctly advantageous, apart from fuel cost, for it not only gives a higher boiler efficiency but also permits of automatic steam-raising being installed. As the number of boiler attendants is reduced in this way a part of the extra cost of the oil fuel is recovered on wages. Under this arrangement each boiler is fitted with a fully automatic oil burner. When oils of very high viscosity are used each burner is provided with a thermostatically-governed steam-electric preheater. The operation of the boiler is under the control of a pressurestat with a differential which may be set to any required number of lb. per square inch pressure within the scope of the boiler. For example, the burners may be set to shut off when the boiler pressure reaches 100 lb., and when the pressure drops—by reason of the steam usage in the works—to (say) 95 lb. the burners light up again through automatic electric ignition. A considerable saving of oil fuel is thus effected, which saving may, for factories using steam only at intervals, prove oil-fired boilers to be not much dearer than the coal-fired type. A factory producing its own electricity and in which large amounts of process steam are required may choose, often with great economy, to generate current through the use of steam turbines. The exhaust steam from the turbines is still good for the majority of steam-heated processes in which temperatures not much over 100° C. are sufficient. Where floor space must be considered the turbine has the advantage of requiring much less room for a given power than the reciprocating engine. On the other hand the various types of reciprocating engines in use are very satisfactory, where space allows, particularly if of the non-condensing pattern, which permits from 80 per cent. to 85 per cent. of the original heat in the steam entering the engine to be utilised in process work. In some instances it is economical to operate a non-condensing reciprocating engine to supply mechanical power for driving shafting, etc., and to utilise its used steam for operating an exhaust-steam turbine to drive an electric generator for lighting and possibly heating. This method is often adopted when little or no process steam is required, and where the heating in the processes is done by gas or electricity.



The above illustration shows a horizontal uniflow condensing steam engine made by Newton, Bean & Mitchell, Bradford. This type of engine is used either for the mechanical driving of the main shafts of factories or for the driving of the main alternators in factories where the machines are driven by electric motors. In cases where the power is transmitted by means of shafting, the drives from the engine to the main shafts are generally rope drives from the engine flywheel, or in some cases one main shaft is coupled directly to the engine crankshaft. In factories where electrical transmission is used, the main alternator is generally driven either by round cotton or "Vee" ropes from the engine flywheel. The uniflow engine is particularly suitable for this type of drive, because it generally runs at a higher speed than other types of steam engines, and this makes it possible to obtain suitable alternator speed by the use of a single rope drive.

E E

Internal Combustion Engines

In the smaller chemical factory in which steam is not essential a gas engine may be the prime mover either to generate current or to operate machinery direct. These engines may be of the four-stroke per cycle class, or two-stroke. They are made in various sizes and generally the smaller type are single acting, i.e., only one side of the piston is used, but the larger models are chiefly double acting. For small installations the four-stroke engine is usually the most suitable and the mechanical efficiency of this model is higher than that of the two-stroke. The jackets of the cylinders are best water-cooled, except in the smallest engines when air-cooling may give satisfaction. Compared with the steam engine, the gas engine requires more space per h.p., and often higher maintenance, but to counterbalance this no elaborate system of boilers is necessary to operate it. Where the engine is intended to drive a dynamo for the production of electrical power, one may reckon for every kilowatt output of the dynamo 1.34 h.p. in the engine is necessary. To this must be added an allowance for mechanical loss, electrical loss, and the loss entailed in transmitting the power to the required point. These losses are higher for belt driving than for direct coupling. A good guide is as follows. For outputs up to 5 kilowatts from the dynamo, when this is coupled direct to engine, allow 2 h.p. per kilowatt, and 2¼ h.p. for a belt-driven dynamo. For 20 to 30 kilowatts output allow 1½ h.p. per kilowatt for direct coupling and 1¾ h.p. for a belt-drive. Built on similar lines is the oil engine. As the chief fuels used in these engines is kerosene, or heavy fuel oil, the boiling points of which are much higher than petrol, it was formerly necessary—and still is in the older types of engine—to apply heat to the engine for a few minutes when starting up ; or, alternatively, to warm up the engine first with petrol before switching over to oil. Most of the oil engines made nowadays, however, are cold-starting models, the requisite temperature being obtained for starting up by the compression of air within the engine cylinder. In these engines it is very necessary for the fuel spraying device to give a high degree of atomisation to facilitate ignition within the cold cylinder. These oil engines are very suitable for use directly as prime movers to supply mechanical power to shafting or to machinery direct, or, through a generator, to give electrical power. They are made in sizes for general factory work from a few h.p. to 100 h.p. or more. The thermal efficiency is greater in the larger sizes, but this efficiency falls rapidly with any overloading of the engine. It is therefore false economy to install an engine of smaller capacity than is demanded by the work to be done. The Diesel class of oil engine probably gives the greatest efficiency of any type of internal combustion engine for power generating purposes. In this type the fuel oil is injected by compressed air at a pressure of from 500 lb. per sq. in., the exact pressure used varying with the viscosity of the oil fuel and the load on the engine, through an atomiser into the engine. The Diesel engine is made in both four-stroke cycle and in two-stroke models, and in sizes ranging from a few h.p. up to 1,000 h.p. or more for heavy power-station work. Efficiency is about the same in both large and small engines. Fuel consumption being about 0.30 lb. to 0.32 lb. per i.h.p., or, computed on a b.h.p. basis, it is about 40 to 60 per cent. higher when running at normal load.

Power Transmission

In many factories frequent breaking of belts leads not only to bad tempers but to material loss in the form of spoiled batches. Whenever possible the lower side of the belt should be the driving side so as to increase the arc of contact by the sagging of the slack side. Unless in a relatively long drive the diameter of the two pulleys engaging the belt should not exceed the proportion of 6 to 1. An approximate calculation of the power of leather belts may be made from the following formulae:—

$$F = \frac{33{,}000 \times \text{H.P.}}{V}, \text{ or } F = \frac{W \times T}{2}.$$

$$\text{H.P.} = \frac{V \times F}{33{,}000}. \qquad W = \frac{33{,}000 \times \text{H.P.}}{\frac{T}{2} \times V}.$$

In which H.P. = actual horse power ; W = width of belt ; F = driving force ; T = working tension from 70 to 150 lb. per inch of width ; V = velocity of belt in feet per minute.

The chain drive gives a higher efficiency than the belt drive, because "slip" is not possible and friction is reduced to a minimum. Probably the roller chain is the one most favoured for the driving of the various machines in the chemical factory. Such a chain requires almost constant lubrication when in use. It may be lubricated either by allowing the chain to run through a bath of oil or by a drip feeder working on the inner surface of the chain. The maximum gear ratio for roller chains is about the same as for a medium length belt drive. Normally, the roller chain is used when the pitch line speed is less than 600 feet per minute. For higher speeds a toothed chain is invariably employed, which chain is suitable for speeds up to about 2,000 feet per minute. With most chain drives the distance between the centres of the wheels concerned should not be less than the diameter of the two wheels added together. Excessive wear and tear on a chain drive can generally be traced to faulty installation of the machinery ; for it is very necessary to get the chain exactly at right angles to the corresponding shafts.

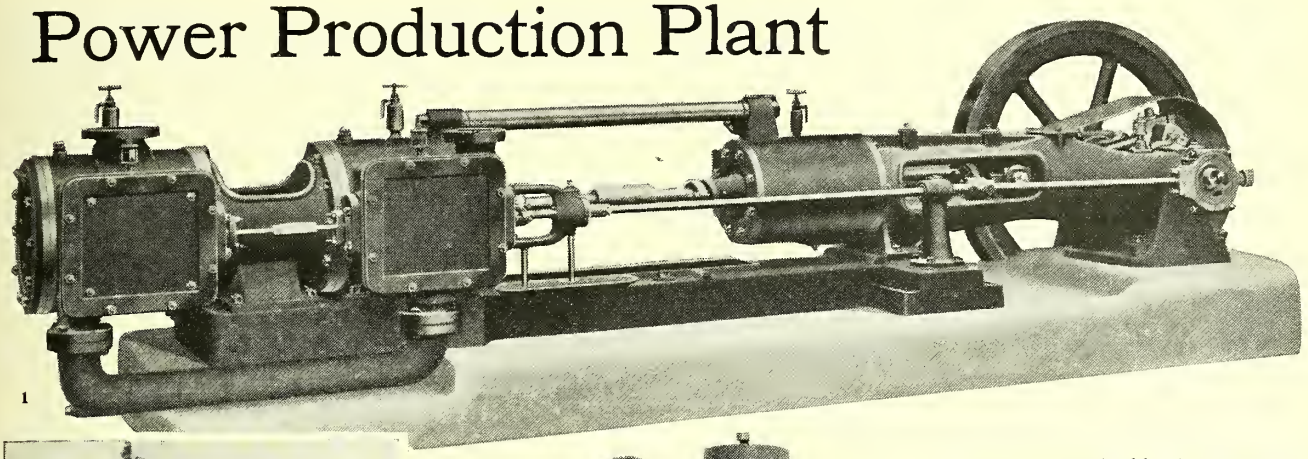
Electric Motors

Motors in chemical factories frequently have to withstand very severe conditions, such as fine erosive dust, and corrosive fumes and vapours. For this reason they must have windings specially impregnated and be specially enclosed. In the case of a motor operating a fan exhausting hot gases or acrid vapours which would be liable to damage the motor, the latter is kept at a distance from the fan ; either by means of a long shaft extension if the fan is direct-coupled, or a better plan is in most cases to drive the fan by belt or chain, and in this instance it is often possible to use a smaller motor because the r.p.m. of the latter are generally in excess of those required by the fan ; thus by suitable belt coupling an economy in power is effected and the motor protected from injurious atmospheres. In workrooms where inflammable vapours are apt to be present the motor is best situated outside the workroom, and the machinery in the latter operated from a countershaft connected to the outside motor by belt or chain. By keeping the motor outside such a workroom a saving in insurance costs is effected. Where a battery of centrifugal machines is operated at once it is invariably more economical to arrange a group drive and work all from one motor rather than operate each centrifuge with an individual motor, because a motor operating one centrifuge must have a power disproportionately high, due to the heavy demand on the motor when starting up a loaded centrifuge. When operated in a group the machines already in motion act as a fly-wheel to maintain a steady rotation of the whole system when other machines are being started up, without any excessive demand on the motor. In groups of mixing machines or similar plant with agitating gear the power costs may be reduced by allotting a small motor to one, or to each pair of machines, instead of operating the entire group from a countershaft worked from one large motor. Thus when any particular machine is at rest no power, or wear and tear on belt drives, is being wasted.

Air Compressors

In the chemical or drug factory air-compressing machines in use may be broadly divided into two classes, one for low pressure operation and the other for high pressure requirements. Low pressure, i.e., a pressure corresponding to a few inches of water, is used for such operations as the ventilation of workrooms, for some types of drying chambers, gas blow pipes, and so forth. These low pressure requirements, when not excessive, are met by the installation of fans or blowers, which operate more economically for low pressure work than the compressor proper. The latter machine is only necessary for much higher pressures. It may be divided broadly into three distinct types, viz., turbo-, piston- and rotary-compressor. The rotary machine is usually most suitable for pressures from a few lb. to 40 or 50 lb. per sq. inch. While the piston type is more satisfactory for higher pressures where relatively small quantities of air are required, the turbo machine, in general, works economically only where large outputs of air are needed, and this apparatus is now extensively employed for big outputs at any desired pressure. For the higher pressures the air is compressed in two stages or more, being cooled between each stage to absorb heat of compression. In the chemical factory the air pressure normally required for agitating liquids in tanks, or for air-bleaching operations, is between 10 and 15 lb.

Power Production Plant



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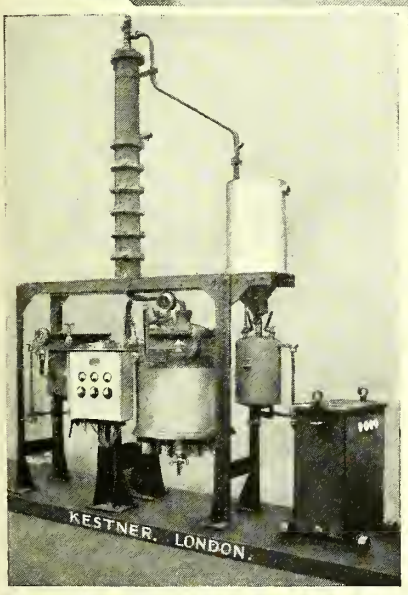

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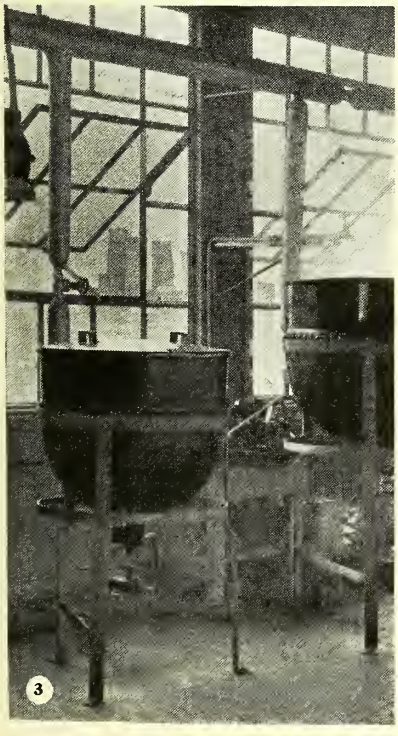

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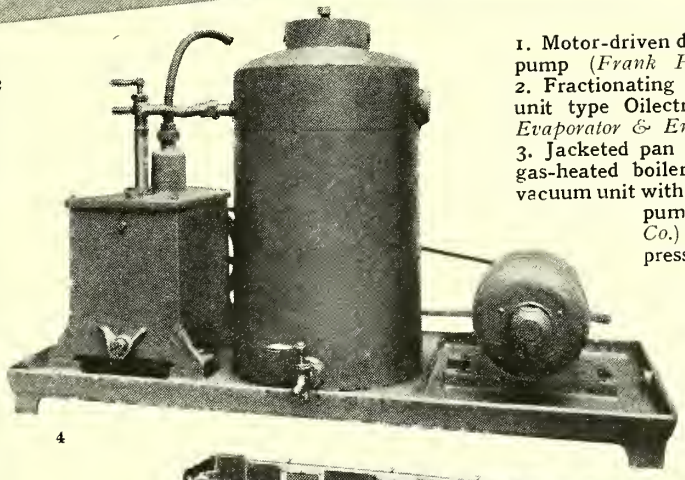

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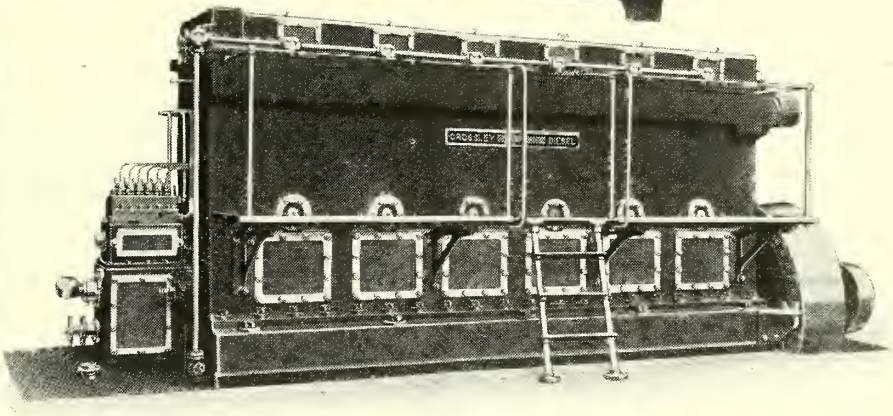

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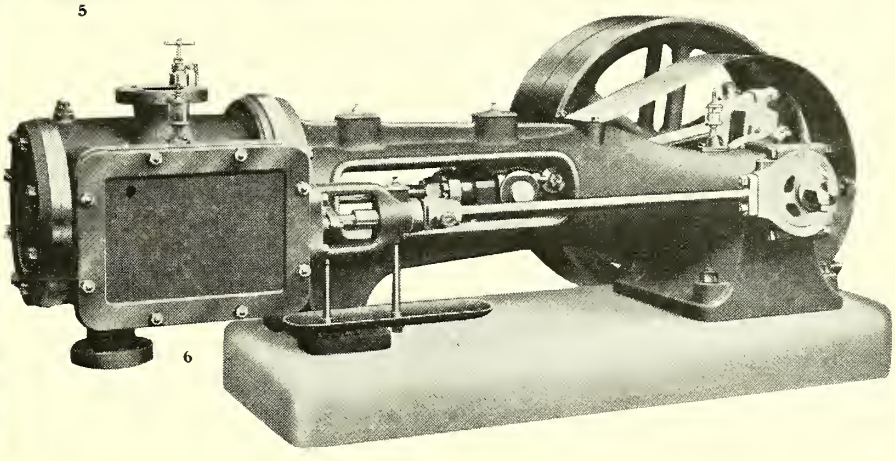

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1. Motor-driven double-stage vacuum pump (*Frank Pearn & Co., Ltd.*) 2. Fractionating Still heated by unit type Oilectric system (*Kestner Evaporator & Engineering Co., Ltd.*) 3. Jacketed pan utilising steam from gas-heated boiler. 4. Self-contained vacuum unit with oil-immersed rotary pump (*W. Edwards & Co.*) 5. Vertical compressorless 6-cylinder Diesel engine (*Crossley Brothers, Ltd.*) 6. Belt-driven single-stage vacuum-pump (*Frank Pearn & Co., Ltd.*)

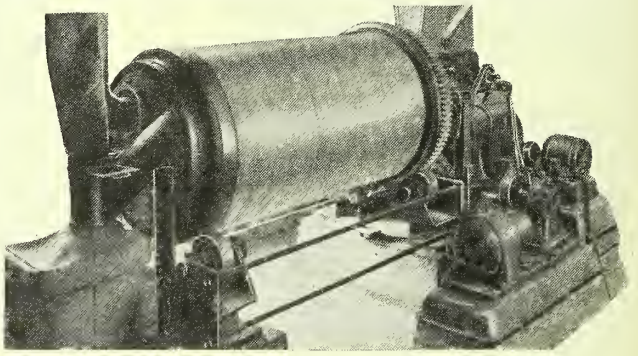
per sq. in. To maintain a strong current of air through dryers, or for drying filter-press cakes, a pressure of about 25 lb. is needed. For spraying and atomising processes, sand blasting, and use in acid eggs, a pressure of 80 to 100 lb. per sq. in. is commonly used. The power required to drive a compressor for a specific output varies with the method of driving. This may be by belt or chain, direct coupling, or by gears. Theoretically, at a working pressure of 100 lb. per sq. in. the power required for isothermal compression of a cubic foot of atmospheric air is 0.131 h.p., but in practice it is considerably more, due to friction losses and power lost as heat. These losses are proportionately less in the bigger machines. In the majority of cases the least power loss occurs when the compressor is direct-coupled to an electric motor or other power unit, which eliminates belt slip and its attendant losses, besides often saving appreciable floor space. Although where a suitable countershaft and pulleys already exist a belt drive may be preferred. A useful feature for a small compressor is an automatic starting and stopping device, particularly so where the demands for compressed air come only at intervals. This idea embodies a motor switch controlled by the air pressure, which, upon rising to a predetermined point, throws out the switch and closes it again when the pressure reaches a given minimum. Many of the compressors in use to-day may be adapted to give a vacuum service also; the degree of vacuum obtainable being equal to 28 in. of mercury or even more. Compressed air is finding extending applications in the manufacture of chemicals, e.g., for atomisation purposes, and in spray drying, which permits many heat-sensitive materials to be dried without injury. Urea, for example, is now dried by causing a horizontal jet of compressed air, at 30 to 60 lb. pressure, to impinge on a slowly moving stream of the solution issuing from a vertical tube. Milk is treated in much the same way, but only a pressure of from 6 to 10 lb. is used. With many materials the use of compressed air atomisation permits of lower pressures being used than are required with other methods of atomisation.

Vacuum Equipment

Modern manufacturing methods make increasing use of reduced pressure for the production of various sensitive chemicals and drugs which must be heated and which are readily damaged by excessive contact with air. To obviate such injury to the products the process may be carried out under a partial vacuum, or under a very high vacuum according to requirements. Where several units of plant in different parts of the factory require reduced pressure service the present tendency is to install an exhaust unit of suitable size at one point of the factory to cope with the entire demands of the whole system. The vacuum service is laid on in the form of pipe lines which are connected to any required point for use. For dryers or reaction vessels, needing a vacuum up to 27 or 28 in. of mercury, a single-stage vacuum pump, or the vacuum created by a suitable air-compressor, will usually meet the requirements; but for higher vacuum service, such as in vacuum distillation processes, very low temperature drying, etc., a double-stage pump, giving a vacuum to within a few millimetres of mercury, is necessary. Vacuum pumps are commonly divided into two classes, wet, and dry pumps. A wet vacuum pump will not only handle air, but the vapours also, if any, coming off the product. Usually this is water-vapour or other non-corrosive vapour, and this vapour passes out through the pump exhaust with the air. Under the same conditions, however, a higher vacuum will be obtained by causing the hot vapour to pass through a condenser and out of the system through a barometric sealing line or other arrangement, leaving the pump to handle only the air. This separation of the condensate is essential if the vacuum service is operated by an air-compressor. A dry vacuum pump is intended to handle air or inert gases only, so that this type invariably works in conjunction with condensers whenever vapours are present. If, by any chance, water happens to get into the dry vacuum pump while it is running the results are nearly always serious, and may result in a smashed cylinder. This does, occasionally, happen through the cooling water in the condenser leaking through the condenser tubes or coils and passing into the pump. It is a useful plan, therefore, to have a closed vessel between the condenser and the pump to trap any water or condensed vapours which may happen to leak from the condenser. This trap vessel should be provided with a cock at the base, which is opened at intervals to run off any accumulated liquid. When the vapours arising from the products are of a corrosive nature these are not generally handled direct by the vacuum condensers but are first absorbed in a chamber provided with suitable absorbent materials before the remaining vapours, if any, proceed to the condenser. For the smaller factory, in which a large vacuum service is not required, a rotary oil-immersed pump is an asset, producing vacua equal to those obtainable with piston type pumps, and in favourable circumstances to within a fraction of a millimetre. On these units an absorption chamber is provided for collecting acid vapours, etc., by means of appropriate absorbents, which chamber also serves as a vacuum equaliser. In every pipe-line vacuum service the success of the system depends largely on the cocks at the various line junctions. One small leak on these would destroy the whole service. To overcome this special types of oil-sealed cocks have been designed which are suitable for pressures as low as one-thousandth of a millimetre. These small vacuum units are very economical; the cost of current for the motor being about one penny per hour, and the displacement speeds range from $\frac{1}{4}$ to 225 cubic feet per minute

Gas

Town gas has long been an efficient servant in chemical process work, notably for the heating of furnaces, kilns, ovens, dryers and incubators. Recent developments include its application to the heating of dryers of the continuous drum type, especially for the handling of materials which are normally troublesome to dry on account of part of the water being present chemically combined with the wet material. This difficulty has been overcome by the introduction of a special type of louvre drum dryer, in which a current of hot air and products of combustion from a series of gas burners are drawn by a fan continuously through the dryer and in such a way as to penetrate throughout the material. Any desired temperature may be maintained through thermostatic control of the gas-burners. Gas is also successfully applied for the production of low-pressure steam for process work and for general heating. The steam is produced in automatic gas-fired vertical steam boilers—controlled by a thermostat to give the desired pressure—from whence it is lead to any part of the factory. Such a boiler installation is very suitable where steam requirements do not warrant the laying down of a big steam power plant, and the efficiency of such apparatus compares favourably with any



Gas-heated louvre type dryer for powders

other means of steam raising. In shelf or tray dryers, for the drying of a large variety of products, gas may be profitably used. The heating of the dryers by gas is not direct, but through hot air circulated by fans so arranged as to recirculate any portion or all of the air according to requirements. In isolated districts, where town gas is not available, or even within the town area, it is sometimes advantageous to install a producer gas plant. The gas from such a plant may be used for driving gas engines, in addition to the multifarious uses to which town gas is put; although it should be remembered that producer gas has a heating value of only about one quarter that of good town gas, volume for volume. For example, a cubic foot of producer gas made from anthracite contains from 100 to 140 B.Th.U., from wood about 130, and from coke about 136 B.Th.U.; whilst town gas gives from 400 to over 500 B.Th.U. per cubic foot, depending on the district. The construction and operation of gas producers are fairly well

known and little alteration has been made in the basic principles of the apparatus for many years. There are, however, one or two points worth noting. The design of the plant, particularly the ash-pit must be in keeping with the kind of raw materials to be used, which may be anthracite, bituminous coal, coke, wood, wood charcoal, and even sawdust—wood shavings and straw are used in large quantities. When the latter waste materials are utilised a separator is usually included in the plant to arrest the tar and other undesirable deposits before the gas proceeds to the holder. With most types of suction gas producer a gas of more uniform composition is obtained if a fan be placed at the outlet of the gas scrubber, for this arrangement maintains an even temperature in the combustion chamber. One of the advantages of gas as a fuel is the ease with which it can be accurately controlled by means of a thermostat.

Electric Heating

During the past few years the cost of electricity to the chemical manufacturer has been appreciably reduced, partly through the introduction of the grid scheme and partly because power production costs have been lowered by cheaper fuel and more efficient machines. This has given an impetus to the use of electricity as a source of heat in manufacturing processes. Applied in this direction, electricity appears often to be dearer than other methods of heating, especially so if the cost of heat units only is reckoned. To offset this higher cost there is a bigger efficiency in the heating process through the greater facility with which electric heat is controlled. There is also less wear and tear on the plant, more cleanliness, absence of fumes, and labour costs are reduced. To the manufacturing chemist one of the most recent and interesting applications of electric heating to his sphere of industry is represented by the electrically heated still, for the distillation of both inorganic materials as hydrochloric and nitric acids, as well as for the handling of organic solvents, essential oils, and essences. A typical specimen of this apparatus is one used chiefly for the production of chemically pure hydrochloric and nitric acids from the crude acids. The retort itself may be constructed of acid-resisting synthetic resin material, into which is inserted two graphite electrodes, and the heat produced results from the resistance of the acid to the current passing. In this particular instance the heat efficiency of electricity approximates to that of coal, even in Great Britain, for one unit of current produces the same amount of pure acid as 7 lb. of coal by other methods. Probably the most familiar form, as yet, of electric heating in the chemical factory is the heating elements of nickel-chromium wire, suitably insulated, and arranged inside vessels for the heating of solutions, etc. These elements are now made with a variety of outer casings which are interchangeable ; so that the appropriate casing may be used which is inert to the specific solution or liquor to be heated. Formerly some trouble was experienced with these heaters due to encrustations forming on the outer surface of the casing, thus preventing rapid egress of heat and leading to premature burning out of the element from overheating. These disadvantages have now been overcome by using the interchangeable outer casings. The elements are also made in the portable form, which are particularly useful to small manufacturers with a minimum of plant, because any vessel containing solutions may be electrically heated by simply suspending the portable heater in the liquid. Another recent application of electric heating is found in the drying of chemicals and drugs. In one type of this plant air from a compressor or blower is caused to pursue a circuitous route around a series of heating elements before passing into the dryer. Or the same heater may be installed at one end of the dryer and an exhaust fan at the other end, by means of which a current of hot air is drawn through the dryer and out through the fan. Both tray dryers and the endless-belt variety are now equipped with flat-plate heating elements between the trays or belts. An advantage here is that higher temperatures, when necessary, can be obtained with electricity than with steam ; so that with chemicals that are not too vulnerable a more rapid drying ensues. To the manufacturer without a boiler plant and who requires a moderate amount of process steam at intervals the electric boiler is a distinct advantage. Steam is produced at a pressure up to 100 lb. per square inch, one unit of electricity producing 3 lb. of steam. The boiler efficiency is about 95 per cent., which is higher than the big boiler installations.

Punches and Dies

IT is almost impossible to stress unduly the importance of the quality of the steel used in the manufacture of punches and dies for tablet-making machines. In recent years considerable improvements have been made, notably as regards electric hardening and accuracy in grinding, so that it is an easy matter for a good punch maker to work to limits as fine as two ten-thousandths of an inch. Such accuracy is becoming more and more important, as manufacturing chemists are more and more particular in regard to size, weight and finish of their tablets. It may be asked what is the best kind of steel to use in making punches and dies. Cheap steel is no good, and it is only a waste of time experimenting with it if the punches and dies are expected to retain their accuracy. For punches, an alloy steel is required that will harden in oil right through and will stand the heavy strains imposed. At the same time, it must be hard enough to wear without chipping at the edges, and also take a high polish. In the case of the rotary machine, the steel should be all of the same quality and hardness, because if the faces of the punches wear unevenly one tablet would be harder than another.

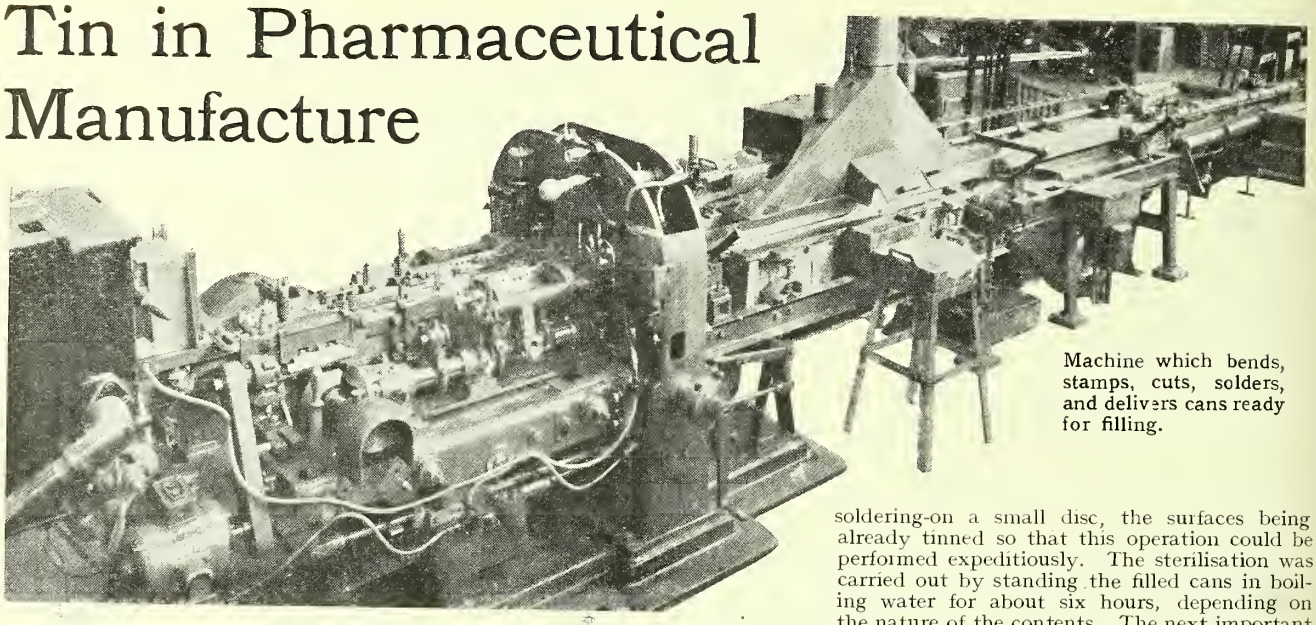
No. 1 No. 2 No. 3

Forms of dies

There is a lot more wear on dies than punches. The pressure is constantly in the same place and exerted particularly on the sides of the die, so that in time quite an effort is required to eject the tablet. Some tablet makers ask for the dies to be ground out slightly tapering towards the top, so that the tablet is easier to eject. This is quite sound practice and can be recommended. The steel for the die should be close grain, should harden in oil right through, stand a heavy pressure, and take a high polish. Also it should not distort in hardening. Every tablet machine maker has his own ideas as to what is best regarding the shape of the die to suit his machine. There are three types in common use, and these are shown in the accompanying illustration. No. 1 is easy to make and suitable for ordinary round work provided there is sufficient metal round the hole to keep the die from squeezing out of shape. When fancy shapes are required such as square, octagonal or diamond, where there are sharp corners, No. 2, with the flange in the middle, is better, particularly when fitted in a split-half table, as is used for double punch work, because when the table is closed the die cannot move, being prevented from lifting by the flange in the middle. This type of die can be reversed and will stand a lot of heavy work. Type No. 3, with the flange at the bottom, is mostly used for fine small work which requires a careful adjustment as on a compressed pill and tablet machine. Some of the punches in use for this work are as small as $\frac{1}{8}$ in. diameter and have a very keen edge. The steel used in making these small punches has to be specially treated, because with the edges so thin, and an outward pressure, they have to be carefully tempered. If too soft they bend, and if too hard they chip. When using the single flanged die it is usual to use flanged punches as well. This is to ensure that the punches are truly closed and will go into the die clean without rubbing the sides. There is one important point that is often overlooked: the table and punch holders wear in time, and the punches and dies fit too easily in the holes. These should have careful attention and be corrected as soon as possible. Owing to the nature of the material it is sometimes desired to compress, steel punches are not suitable for the work, and then ivory, delta metal or electro-plated steel is used.

COMPULSORY NOTIFICATION SUGGESTED.—The suggestion that compulsory notification of whooping cough, by its psychological effect, might be useful if combined with a campaign to educate parents in the early symptoms and dangers of the disease is made in the annual hospitals' report of the London County Council, issued recently.

Tin in Pharmaceutical Manufacture



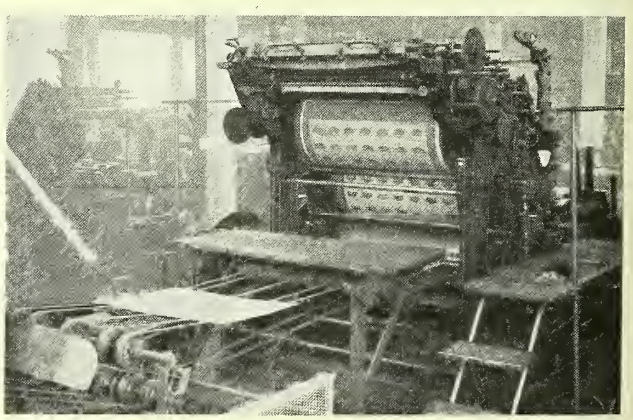
Machine which bends, stamps, cuts, solders, and delivers cans ready for filling.

TIN and tin compounds are used to a slight extent in medicine. A mixture of metallic tin and stannic oxide is the basis of a proprietary medicine and ointment for the treatment of staphylococcal infections. The powdered metal has been used as a tæniacide. Solutions of stannous chloride and stannated hydrochloric acid are among the reagent solutions in the appendices of the British Pharmacopœia, 1932. In cosmetics stannic oxide, diluted with other compounds, is found in certain nail polishes. A mixture of tin and lead oxides, known as putty powder, is used for polishing glass. In the main, however, it is in the metallic state that tin finds its greatest uses.

Tinplate and its Properties

The important reason for its widespread adoption in manufacture for containers is its resistance to oxidation. This makes it ideal for coating sheet steel, the resulting product having some of the properties of both metals. It is readily cut, stamped, rolled, curled, seamed and soldered, and for this reason is the most popular metallic material for making containers for many foodstuffs, manufactured foods, pharmaceutical products, confectionery and so on. The "canning" industry (sealed containers) consumes approximately half the world production of tinplate. The industry is mainly concerned with fruit, fish, vegetables, meat and milk, and so does not concern the pharmacist unless he stocks condensed milk; some brands of milk powder are being issued now in sealed cans. Many disinfectants and insecticides may also be said to come within the same category; the tins are not strictly sealed containers, but the manufacture is similar. The canning process was invented in the early nineteenth century by a Frenchman, Nicholas Appert. Appert was awarded a prize by the French Government for devising a successful method of preserving food for the French army. But the first man to use a tinplate container for this purpose was Peter Durand who, in 1810, made this the subject of an English patent, the idea having been "communicated to him by a certain foreigner residing abroad." Durand's canisters were cylindrical and similar in shape to present-day cans, but they were made entirely by hand. The raw material was tinned iron sheet, lavishly tinned according to present-day standards. Sheets of this material were marked out and cut by expert tinsmiths, bent into shape on a roller, the edges overlapped and soldered together, and the two ends attached by solder. The discs were cut larger than the cylinder and the edges were turned over to form a flange, which fitted closely round the body. The flanging was done by means of hammering on a stake by the usual method of craftsmen in metal. One of the discs had an aperture cut in it beforehand, and the canisters were filled through this hole which was, after sterilisation, closed by soldering-on a small disc, the surfaces being already tinned so that this operation could be performed expeditiously. The sterilisation was carried out by standing the filled cans in boiling water for about six hours, depending on the nature of the contents. The next important development was the invention of a machine for converting flat discs into vertically flanged caps by dropping a heavy die on them. Various improvements in soldering and seaming followed. The filler-hole type of can remained the standard form of tinplate food container until the end of the century, when development of the double seamed "open top" or "sanitary" can had advanced so far as to make this a serious rival.

In the early years of this century the open-top can made great progress, and the majority of present-day cans are of this type, although a modified type of filler-hole can is still used extensively for condensed milk and other products. In recent years two general classes of lacquer have been developed for the protection of tinplate from the action of substances in foodstuffs which attack it. One class is sulphur-resisting and is used to prevent the blackening of cans by the sulphur compounds present in meat and some vegetables. The other class is acid-resisting and is used for certain highly coloured fruits.



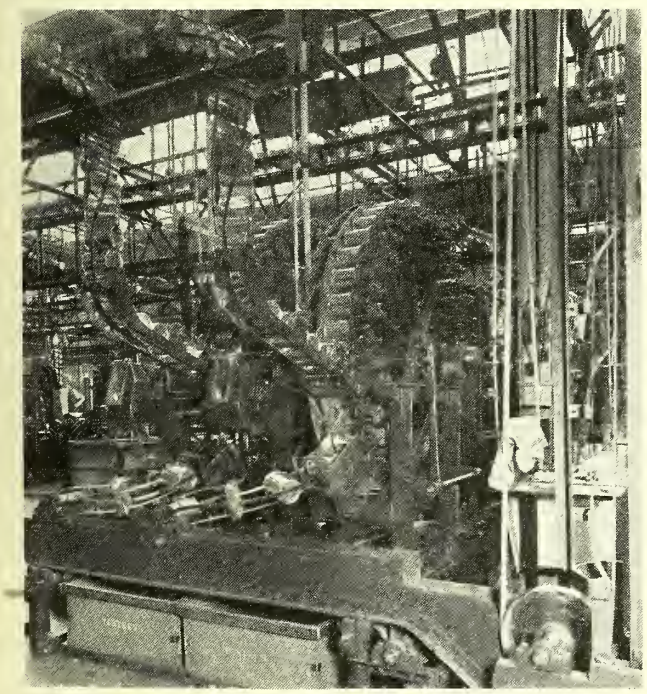
Tinplate Printing Machine

Advantages of Tinplate Containers

The last few years have seen a striking growth in the use of tinplate packages and containers. This is not merely on account of the protection they afford to the contents, but also because of the facility with which they can be made to identify the maker with the contents, to regulate the quantity and to give service to the user. The tin printer has shown that as a medium for the printer's art tinplate is equal to the best

paper. Advertisement matter may be reproduced upon the surface of tinplate with the same ease as on paper, at a comparable cost, and with the added advantage of practical permanence. Tinplate containers are manufactured to exact specification: lids, for example, are interchangeable. For shallow boxes and lids the method of "drawing" gives strength and rigidity superior to that of any form of seam, with the advantage of rounded interior corners and the absence of joints. In recent years this method has been applied to many boxes which were formerly made with seamed corners. The extreme simplicity and cheapness of the wire hinge makes it a usual adjunct to many types of tinplate box. In the latest types, it has been found possible to dispense with the wire. The lid is formed with two small tongues so folded that they can be inserted into the body of the box to serve the same purpose. The most recent type of tin designed for tablets, pastilles, cachous, pellets, etc., is the sliding-lid tin, which permits delivery of the contents one at a time through an appropriately-sized aperture and which will not open when dropped. This has the added advantage that it demands the use of only one hand, leaving the other free.

Special tinplate containers have been developed for distributing powders, polishes, oils, greases and other materials through sprinkler tops, nozzles and jets of many kinds. One of the latest powder closures provides a successful, tight re-seal which is really powder-tight and at the same time convenient and smooth in action for talcum powder, tooth powder and similar fine powders. The three-plane construction of this new cap prevents the contents percolating through and scattering themselves in unwanted places. In addition the closure is easy to open and close and cannot get lost. Another closure, which was introduced to the trade at the beginning of 1936, is the helmet-shaped "tip-top" cap. Only one hand is needed to hold the tin, snap over the outer cap and dispense the contents. With both closures, several sprinkler holes or



Testing cans by vacuum machine

a single larger hole can be adopted. The cleanliness, economy and convenience of these containers is a powerful factor in influencing the buyer, and experience shows that a manufacturer who has taken the trouble to use an especially suitable tinplate container has his reward in the increased interest displayed by purchasers. Powdered soaps, disinfectants, and insecticides are most conveniently stored in their original containers, which are usually fitted with the appropriate means of dissemination. One of the more interesting developments in this direction is the "puffer" tin. This puffs out its contents in a number of ways, depending on what is required. Insecticides are atomised; canine anti-canker powders and talcum powders are ejected in a stream; tooth powders are distributed steadily and evenly in one direction.

Many of the products of pharmacists are delicate and easily damaged. Pills and pastilles, carefully weighed powders, and such things as plasters require tinplate containers for protection from damage and from the atmosphere. Seamless lids and boxes are generally used in conjunction with paper wrappings. Creams, greases, salves, and toilet and beauty preparations use either tinplate or tubes which are made of almost pure tin. Tinplate is used also for bottle closures, being strong, neat, hygienic and inexpensive. A much thinner rubber gasket is required than with glass covers, and the metal is more adaptable to vacuum sealing methods. One form of vacuum seal consists of a rubber ring and a tinplate cover with a flange fitting closely, but not gripping, the neck of the jar.

Varieties of tin and tin-plate containers

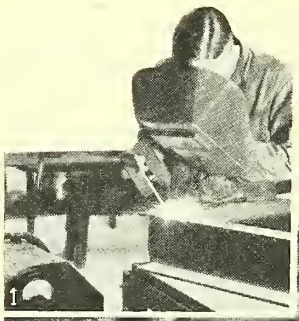
An added safeguard against accidental opening of this closure is afforded by clipping the cover and jar together with a gutter-shaped flexible ring of tinplate having its ends tongued and slotted together. Even without vacuum this combination is a perfectly hermetic seal. In another form the tinplate cover and the glass jar screw together by a thread moulded on each of them. A variation of this is a screw-threaded ring of tinplate which screws on to the neck of the jar and forces a flat disc of tinplate or glass down on to the gasket. But the more important developments in vacuum packing refer to containers which are made entirely of tinplate and in particular to tins which are sealed by the new "cold vacuum" process. The use of this is now becoming more general in pharmacy, even for low-priced articles, for the vacuum pack is now no more expensive than any other sealed pack. Another advance in this connexion is the Scruvac tin, which has an interrupted thread re-seal closure to ensure a perfect seal after the vacuum has been broken. This method of packaging has increased in popularity, chiefly because it protects the product indefinitely against fumes; the contents reach the consumer in perfect condition and untampered with.

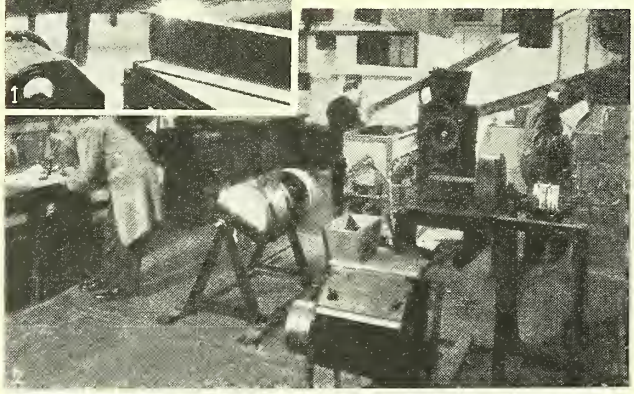
The crown cork type of closure is now making headway as a seal for liquids. It is simple, cheap, perfectly hermetic, and proof against tampering. The closure consists of a resilient packing below a tinplate disc of which the edge is curled downwards so that, after slipping over the neck of the bottle it can be crimped into a recess just below the rim. Two disadvantages are associated with the use of this closure: a special opener is required, and there is no means of re-sealing. A somewhat similar but re-sealable disc has its edge curled over a stout wire so that when strained to one side by a cam or similar device, it forces the disc into the neck recess. Corks are fitted with caps of tinplate to strengthen them where they are gripped during opening and to prevent their being driven too far into the bottles. The Selex double shell and the Unishell caps are two tinplate closures which compete successfully with plastic caps. The double shell cap consists of an outer shell on which there is no thread, which can be printed with any design, whilst the inner shell, carrying a pronounced thread, gives smoothness of fit. The Unishell is similar in appearance but in one piece.

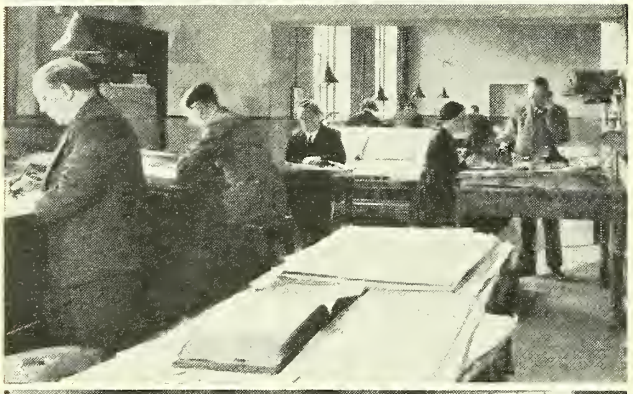
Machinery photographed by courtesy, Metal Box Co., Ltd.

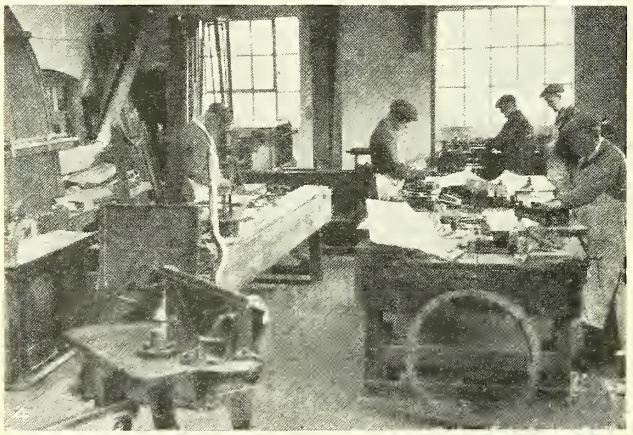
Gardners of Gloucester

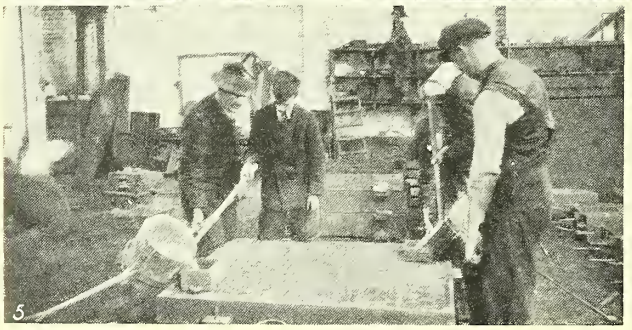
A visit to the West of England factory in which the patent "Rapid" Sifting and Mixing machines are made











FORTY years have passed since a representative of THE CHEMIST AND DRUGGIST last visited the Gloucester works of William Gardner & Sons (Gloucester), Ltd. That visit took place shortly after removal of the organisation from premises in Llanthony Road, Gloucester, which had become too small, to a new building on an extensive site in Bristol Road, the present address. In 1896, comment was made on "a dozen big mill stones along the front of the building" and upon the range of sizes, from seven-pound to one-ton, of the patent Rapid Sifter and Mixer for which Messrs. Gardner were already world-famous. When the present writer was driven to the Bristol Road works he hardly expected that his first impression would also be of stones maturing against the outer walls—eventually to be used in the make-up of edge-runner mills, etc.—but so it proved. Mr. H. B. Norris (Mr. Frank C. Gardner's assistant), who acted as guide, appeared to have an encyclopædic knowledge of the firm's history and present activities. The founder, Mr. William Gardner, started in business on his own account as a millstone maker in 1859. Mr. Charles E. Gardner, J.P., the present chairman and son of the founder, has been actively engaged in the business for over fifty years. In addition, he has found time to devote many years to municipal work in his native city, having been a member of the City Council for over twenty years, High Sheriff of Gloucester in 1920-21, mayor in 1923-24. He was made an alderman in 1926, and has been a magistrate since 1914.

Years of Expansion

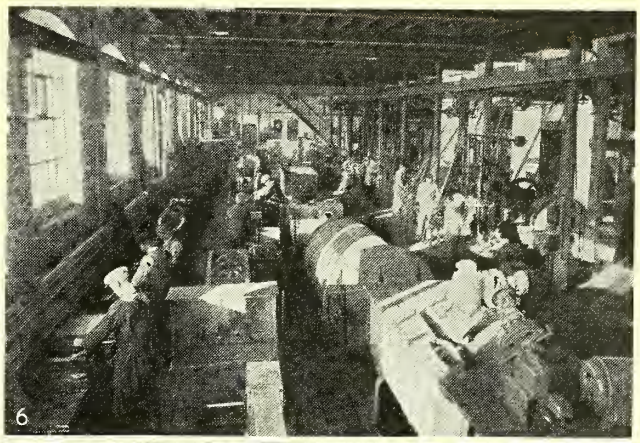
Since 1896 the business has grown enormously. It now serves an astonishing diversity of industries, including, in addition to the drug trade, beauty, face and toilet powders, chemicals, foods, explosives, rubber, artificial silk, paints, tea blending, flour and provender milling, cattle foods, milk, casein and many other products. A separate technical staff is available at the London office and agents have been appointed in various countries throughout the world. It was plain, from a conversation with the managing director, Mr. Frank C. Gardner, son of the chairman, that the firm's reputation in so many industries was secured based on an intimate and profound knowledge of the theory and practice of grinding, sifting and mixing. For eight years, which included the so-called depression, not an employee has been "stood off." During this time new plant has been acquired, improvements and extensions have been carried out to cope with expanding trade, and it is understood that further extensions are about to be commenced on the general and drawing offices. Perhaps the best impression of the works can be gained from following an imaginary purchase from start to finish, afterwards visiting departments through which it may not have passed. The prospective buyer may well commence by examining standard stock machines in the warehouse, to see if there is one which will serve his purpose. In this room numbers of grinders and mixers, dryers and sifters, large and small, are kept in stock. The smallest standard machine for which there is any demand to-day holds fifteen pounds and the largest two tons. Special orders go outside this range, and a colossus of forty-ton capacity once constructed (not for the drug trade) required the doorways and wall of the factory to be cut away before it could be delivered. Curiously, though so many standard machines are catalogued, it usually happens that a client's requirements involve some individual feature. The testing room ought therefore to be mentioned at this stage. A sample of any product or raw material to be treated is here put through experimental machines to ascertain the optimum degree of comminution, best speed of grinding, and similar data. On the basis of the results obtained a suitable machine is designed. The testing room is also the department in which are tried out the spraying attachments for blending liquids with powders. Tooth powders, for example, may require the incorporation of a specified proportion of essential oil. The method adopted is to inject a measured quantity of the liquid into the mixer during the normal mixing time, by means of a fine jet adjusted to the length of the apparatus.

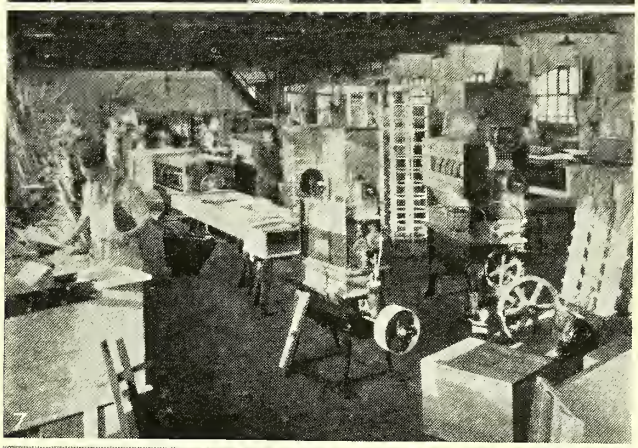
From Plan to Product

It is assumed that the details of our hypothetical machine have been agreed upon. The order then goes to the technical department and drawing office. Both are large and important departments. Experts and draughtsmen are constantly at work preparing detailed working drawings of machines and parts to be made up in the works. The completed drawing shows detailed dimensions sufficient for pattern maker, assembler, woodworker and others. It goes first to the pattern-making shops. A replica in wood is made for every cast part of the machine, and the finished pattern is sent down to the foundry. It is embedded in a shallow pen or tray of sand (described as a mixture of red and white sand, but to a layman resembling nothing so much as powdered graphite). Sand is firmly pressed into every corner, crevice, groove or hollow, so that a perfect mould is made. The wooden pattern is removed and the mould "trued up," whereupon it is ready for casting. Casting is carried out about once or twice a week, according to the number of orders in hand. Two blast furnaces outside the foundry prepare the metal, delivering it inside the shop. The furnace is charged with "pigs" or ingots of new metal, together with a pre-determined proportion of scrap iron to produce a tougher, more durable product. Molten iron is poured into the moulds (as if they were suppositories), allowed to cool, removed and finally furbished before passing on to the various assembling shops. Here the cast frames and working parts are put together. Iron is the metal most commonly used in the machines, but many parts have to be made of stainless steel, monel metal, brass or gun-metal; or lined with tin, chromium or nickel, zinc, galvanised iron, or glass enamel, according to the chemical nature of the substances to be ground or mixed. Sometimes machines are constructed for special purposes entirely of wood—sifters, of course, invariably so, from specially seasoned timber. In both pattern and machine part the same perfection of woodworking skill is apparent, but the woods used are entirely different. A hard, smooth, fine-grained wood without possibility of shrinkage is required to give adequate service in the machine. Other properties are required in the wood used for patterns. In the metal shops, precision seemed normal and inevitable. To see to what close measurements the wooden parts were also fashioned was unexpectedly impressive. Equal care is, indeed, given to the final operation: painting. In the paintshop metal parts are painted, wooden parts painted or varnished, transfers added. Finally, in the packing department, the machines are made ready for despatch to customers.

Auxiliary Departments

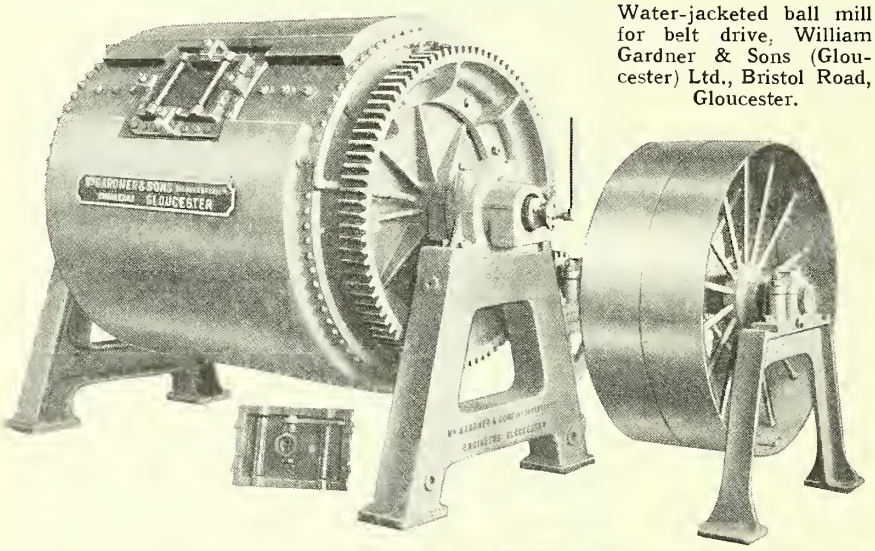
Other important operations remain to be described. The department for making brushes is almost a factory in itself; the brush maker is a distinct craftsman. His materials are the brush base: a length of smooth hard wood (in section an arc of the circle on which it is to be mounted) drilled with holes in spiral formation; and plugs of trimmed bristle or fibre. The plugs are wire-drawn into the holes and stitched down firmly in position by hand, the projecting tuft being trimmed parallel to the curved surface of the board by an ingeniously devised pair of shears. The result is as neat a product as any machine could produce, and probably much stronger than any mass-produced brush, for there is no possibility of bristle or fibre coming out. In fact, the brush is an important component of the Gardner patent Rapid Sifter. Little has been said of grinding machinery because it is really too large a subject to be dealt with in one short article. Ball mills, end-runner and edge-runner mills, crushers, disintegrators, graters and shredders are only a few of the types of grinding machinery made. Apart, therefore, from the manufacture of grinders, there remain the sheet metal room, where sheets of various metals are cut, rolled, trimmed or welded by means of electric arc, spot or oxy-acetylene flames; and the stores department. For so many varieties of machinery, all constructed to give prolonged service to the user, a large depository of spare parts is needed. Innumerable components are classified so that they can be sent away to a customer at a moment's notice.





Our illustrations show:—1. WELDING: Using the electric arc. 2. EXPERIMENTAL DEPARTMENT. 3. DRAWING OFFICE. 4. PATTERN SHOP. 5. FOUNDRY: Running molten metal into the moulds. 6. ENGINEERING SHOP: Assembling the metal parts. 7. WOODWORKING SHOP: Assembling the wooden parts. 8. BRUSH SHOP. 9. STORES DEPARTMENT

Grinding, Sifting, and Mixing Machinery

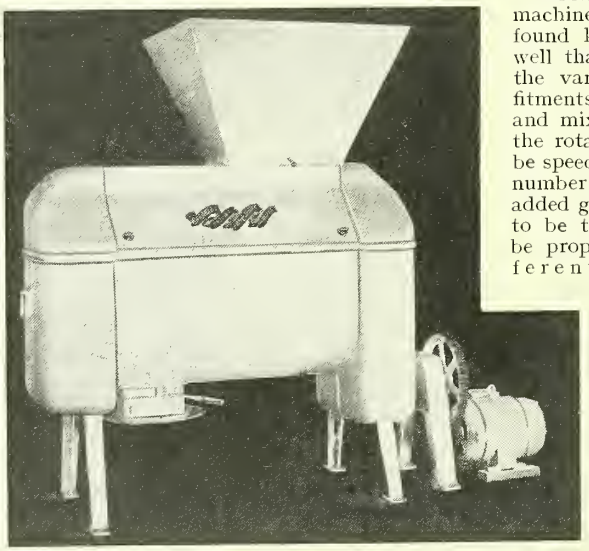


Water-jacketed ball mill for belt drive, William Gardner & Sons (Gloucester) Ltd., Bristol Road, Gloucester.

GRINDING was formerly done on the flat stone mill, the millstones working one on top of the other. Even to-day there are many purposes for which this type of mill is used. The method is now largely replaced by the roller mill, by high-speed grinders, by the edge runner or other type of mill as determined by the nature of the material and the aim in view, and up-to-date engineering firms to-day are generally equipped with experimental plant in which clients' samples are tested out with a view to recommending the most suitable machine for the work.

Types of Sifter

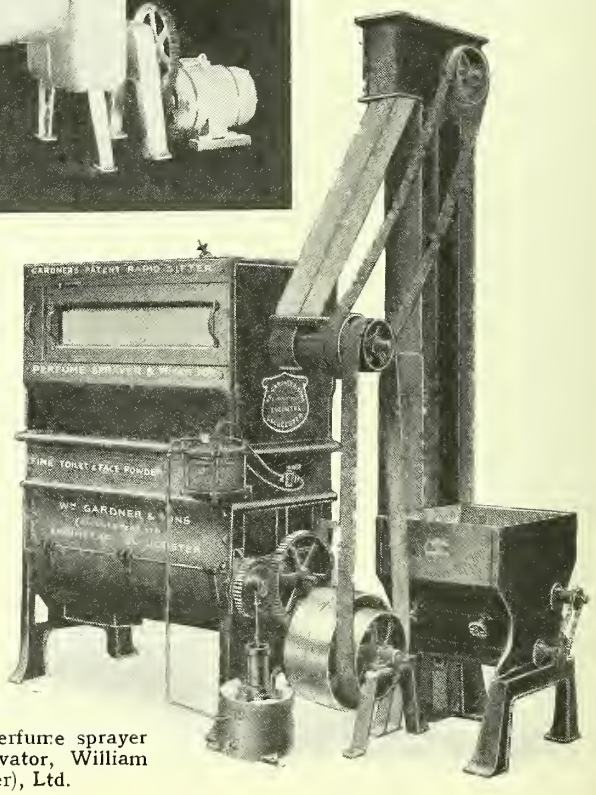
The general practice to-day is to obtain as fine a product as possible, and after preliminary grinding sifting is usually relied upon to obtain the required degree of fineness. A machine to be recommended for this purpose is one consisting of a circular sieve against which a specially designed brush rotates. This gently sifts the material through a mesh which gives the required fineness and separates and discharges all foreign matter. There are various other types of sieves, one being the "Quick Change" dresser, a feature of which is that the barrel or dressing cylinder is made in sections securely fastened together, yet easily replaced in a few minutes by others of different mesh by simply loosening the fittings. The friction caused by an outside brush on some powders is entirely avoided on this type of machine, as no brush is used; in its place is an ingenious arrangement of automatic tappers fitted outside the barrel to keep the meshes clear. There is also the revolving reel type, in which the barrel, being slightly inclined from the horizontal, causes the material fed at the higher end to turn over and fall towards the bottom of the reel, the coarser material being delivered as "tailings" and the finer material passing through the mesh to be collected as "throughs." The centrifugal dressing machine is similar to the reel type, but the rotating barrel is placed horizontally and the material is forced against the screen by internal beaters revolving at a high speed. Where several grades or separations are required the reciprocating sieve type is to be recommended. In this the sieve frames are carried on spring suspenders to give a to-and-fro movement, and a new type of vibrationless drive can now be fitted, the advantage being that very little power is necessary. In some cases it is necessary to mix after sifting, and again the leading machine manufacturers make a variety of machines for this purpose. The world-renowned patent Rapid mixer, for example, is used for accurately blending all kinds of dry powders. Machines are also supplied for mixing liquid materials of a plastic nature. Another with a special, serrated, double-mixing agitator is available for mixing such materials as contain a considerable proportion of moisture, oils, etc. This prevents the troublesome "balling-up" experienced with some types of machines and leaves a free-running, granular product. Recently a machine has been perfected which combines the processes of fine sifting and mixing, and also includes a spraying apparatus which adds liquids, perfumes, essences, flavourings, etc.



Streamlined combined patent Rapid sifter and mixer, William Gardner & Sons (Gloucester), Ltd.

Points for Purchasers

While it is not suggested that the machinery buyer must have a profound knowledge of design, it is as well that he should be familiar with the various labour- and cost-saving fitments that can be built into sifting and mixing machines. For example, the rotating brushes or agitators can be speeded up or down to a calculated number of revolutions per minute by added gearing, thus enabling the drive to be taken from shafts which may be propelling other machines at different speeds. Internal agitators can be made reversible, and this may be of



Combined fine powder dresser, perfume sprayer and mixer with feeder and elevator, William Gardner & Sons (Gloucester), Ltd.

advantage in certain processes. If necessary, earlier machines of the single direction type can be converted to the reversible type at small cost. A machine recently described in an American technical journal consisted of adjacent mixing chambers with grinding machinery at one end. The advantage of this is that it enables a preliminary mixing of coarse or lumpy material to be made before grinding and final mixing. The material is fed at one end of the machine, passed along the first mixing chamber, is ground, and returns along the other mixing chamber to be discharged at the end into which it was fed. Often it is necessary or desirable that the sieve or agitating chamber should be inspected while work is being performed. It is a comparatively simple matter for an inspection device to be incorporated when the machine is being constructed ; to adapt a completed machine is less satisfactory. When buying sifting and mixing machines, manufacturers should make a point of examining with what ease the parts can be washed or brushed out. In the best machines each part is quickly and easily cleaned—a property that is most necessary where, as with most drug trade works, the same machine is used for a variety of powders each in frequent demand. When a combined mixer and sifter is required, it should be inspected to see whether the mixer can be used, if required, independently of the sifter. This may save valuable time in the works. Feeding hoppers can be fitted with regulating gates to control the flow of ingredients towards the agitators ; on occasion a fully automatic feed hopper may be an advantage. The mechanism for ejecting irreducible lumps or foreign bodies from the sifting machine should be examined ; if there is not an efficient outlet spout, the sieve may be choked or damaged, or cleaning the machine may involve waste of time and labour. Agitators are only effective if they are agitating all the powder all the time. Manufacturers may fairly be asked to show proof of adequate mixing by tests taken on similar machines to the prospective purchase. The most convincing test is, of course, an analyst's certificate of the composition of a sample of the powder mixture after an appropriate period of mixing. In general the aperture from which mixed powders are drawn off is at one end of the mixing machine. Purchasers can always have this placed in any other desired position.

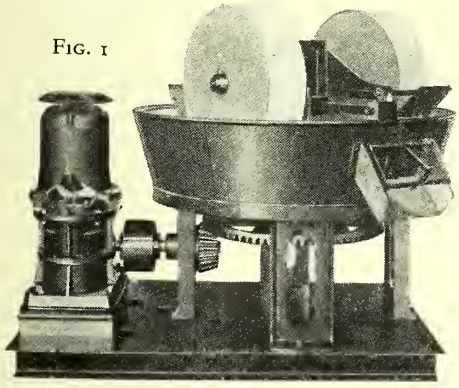
J. Harrison Carter, Ltd.

THE works of J. Harrison Carter, Ltd., pleasantly situated in the ancient town of Dunstable, have a world-wide reputation. The business was established by Mr. J. Harrison Carter in 1873, in which year he opened an office in Mark Lane, London, E.C.3, and supplied some of the first roller mill plants erected in this country. Mr. Carter, who was born at Brighton in 1840, was a man of remarkable personality and achievement. Educated at Lewes and apprenticed at Twineham, Sussex, he began his successful career by taking a mill at Peckham. After opening the Mark Lane office he experimented with machinery in various directions, and secured several valuable patents. During the 'seventies he became convinced, and convinced others, that the days of the millstone were over ; so great was the response that he entered the front rank of milling engineers, fitting up many large mills with machinery of a new type. In 1881 he had a complete roller plant in working order at an exhibition in the Agricultural Hall, London, a fact which no doubt marked the definite change over from stone grinding to the present milling system.

The works at Dunstable were opened in 1894, chiefly for the manufacture of disintegrators. Messrs. Harrison Carter's records of these machines go back, however, to 1888 ; they still have a call for "spares" for some built prior to that date, and have recently overhauled one such veteran sent back to them from France. In 1906 the founder died ; in June 1907 the firm was incorporated as a limited company, with Mr. George Carter as managing director. The manufacture of other machines was taken up, and by 1910 the catalogue issued by the company showed a varied range of sifting, mixing and other machines in addition to disintegrators. A study of later catalogues and drawings shows that these have been improved and brought up to date as time went on, and new types added to suit modern conditions.

Besides their well-known disintegrators, which are used for grinding materials in all trades, Messrs. Harrison Carter now make various types of crushing, sifting and mixing machines as well as the necessary accessories, such as elevators and worms, for the fitting up of complete plants ; they also undertake the erection of these with subsequent service after plant has been put in operation.

Fig. 1



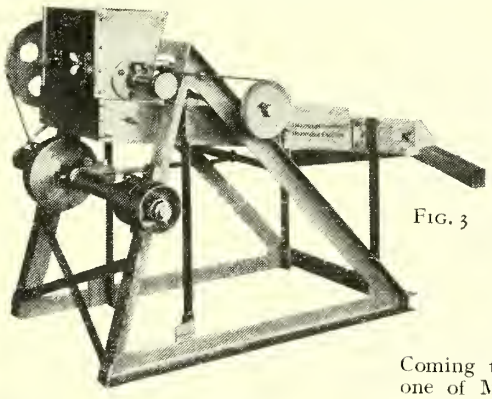


Fig. 3

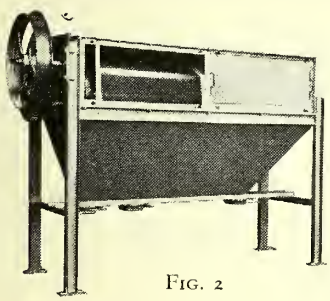


Fig. 2

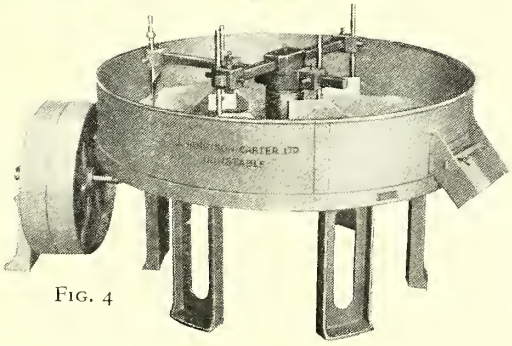


Fig. 4

Typical Specimens

Fig. 1 shows one of the large-size granite edge-runners, direct-coupled to a motor through reduction gearing. This was supplied for use in manufacturing cosmetics. This type of machine consists of best-quality Aberdeen granite stones and bed with a Staybrite Steel pan and scrapers, thus ensuring that the product is free from contamination. When required, it can be fitted with a cover enclosing the stones. Coming to sifters, we illustrate (Fig. 2) one of Messrs. Harrison Carter's sifting reels mounted in a steel frame and hopper. This type, however, is more frequently built in wood, and can be supplied either in the form of a reel or of a centrifugal with beaters inside the cover.

Fig. 3 shows one form of their shaking sifters fitted with a single tray, feed roll and tapping gear to the cover. This machine can be supplied with superimposed trays to give various grades, and these can be made easily removable either for cleaning or changing the cover.

A pan mixer is shown in Fig. 4. Others adapted for special purposes are also manufactured.

Machinery Belting

THE intrinsic value of the engine and the machine must depend to a large extent upon the efficacy of the belt as a link between the two. It cannot be said that any belt is best except in respect of specific drives. Different types of belting are made, not for the sake of mere variety, but to meet different conditions of service. From this follows the explanation why inferior belts frequently give better service than brands admittedly of better quality. It is a question of suitability for the work—an important point to bear in mind.

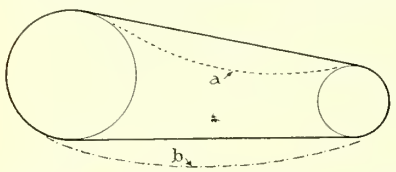


FIG. 1.—*The two pulley open horizontal drive gives the greatest efficiency when the slack side (a) is on top. When the slack side is on the bottom (b) there is a loss of power due to the belt missing contact with the pulley.*

Although there is a conflicting mass of types, brands and qualities on the market from which to choose, it is not a difficult matter to narrow down the search for the ideal belt to reasonable compass provided individual drives are considered separately. All that is needed is a knowledge of (1) the composition of the alternative types, and (2) the effect the existing service conditions can be expected to have on each belt. If the most likely type is then decided upon, the brand can be selected with ease. Like most other commodities in this world of supply and demand belting prices are more or less consistent with the quality—that is to say, serviceability—built into them, and all other factors being equal the purchaser can anticipate with assurance that while the price per foot is higher in superior qualities, the cost per horsepower-hour is lower. The selecting of a belt for any given job is mostly a process of elimination of unsuitable types.

Leather, Rubber, Balata

Leather is tanned, curried and dressed purposely to promote in the finished belt endurance, suppleness and strength. During the process of manufacture the individual fibres are firmly cemented together and they are lubricated with oil and grease. These fibres generally offer a good indication as to quality; if, when they are examined under a glass they seem closely knit, the belt will be strong and long wearing, but if they are loose the probability is that there will be trouble from stretching. Leather belts can be made to-day for practically any service condition, e.g., in high temperatures and steam, wet and for high speed work over small pulleys. On the other hand, oak tanned belts will not give service if the temperature is appreciably above 100° F. Heat dries the oils and fats, with the result that the belt becomes brittle and breaks. Oak tanned belts also fail in wet conditions due to water (or even humidity) settling on the driving face causing the belt to slip and burn. This tannage does not promote very good flexibility—judged by modern speeds and pulley diameters—and consequently it is more economical on big drives where conditions are nearer the accepted normal.

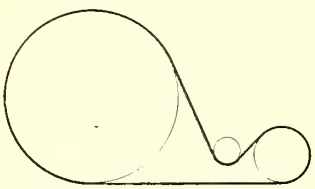


FIG. 2.—*The Lenix idler drive overcomes the lost arc of contact when two very unequal sized pulleys operate at short centres.*

In practically all those classes of work where oak tanned leather works out expensive, rubber gives of its best. Rubber belts are strongly recommended where acid fumes damage leather and in conditions where either heat or wet are found. All rubber belts have a woven fabric base (usually called canvas) which would, of course, be seriously damaged by acid fumes or wet, but the rubber is so impregnated into the cotton texture that the fibres are effectively protected. Heat, too, does not affect the rubber belt as vulcanisation takes place in manufacture at a much greater temperature than could be met by the belt in operation. But rubber will not stand up to the effects of most oils. Both the rubber and the cotton constituents are vegetable products which are dissolved or rotted by mineral oil. Hence, if a drive is so placed that oil sprays or drips on to the belt, rubber is best avoided. One great advantage of rubber is its ability to equip small pulleys operated at high speed, due to its extreme flexibility and its high coefficient of friction. For these drives endless belts of a good brand of rubber are best, provided this type can be installed, as these belts obviate the great difficulty of centrifugal force acting on a metal, or other fastener. Balata belts have a rather similar service field to rubber, except that they will not give the greatest satisfaction in heat. Balata is a vegetable gum which melts at about 140° F., and in making the belt the gum is liquefied and spread between each two adjacent plies. When it cools the plies are firmly cemented together, but should the temperature exceed 100° F. there is a distinct liability for the balata to melt and the plies to separate. In these temperatures, therefore, balata is unsatisfactory as a driving medium.

Factors in Power Transmission

It will be appreciated that the majority of drives can be equipped with the ideal belt, from a choice of only three types of belting. But the type is not by any means all there is to consider when a belt is being placed in commission. Many indeed are the drives which prove to be expensive to operate where the type of belting is correct but the size—width and thickness—is wrong. This, in fact, is the great fallacy. Belts of the same brand do not necessarily deliver power in direct proportion to their cross-sectional area when operating at the same speed. It is common knowledge in the belt manufacturing trade that more belts fail because they are too strong than because they are not strong enough. This state of affairs is the result of the small diameter pulleys in common use to-day.

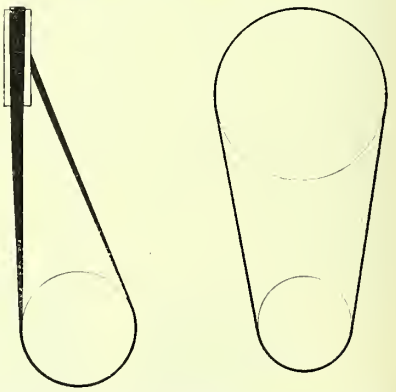


FIG. 3 (*left*).—*The two pulley quarter turn drive is only called for when the shafts are not parallel. Difficulty with this is generally due to faulty application.*

FIG. 4.—*The vertical drive is the least satisfactory. The belt stretches and falls away from the bottom pulley.*

One of the factors concerned in power transmission is the effective arc of contact which the belt makes with the pulley, and it will be seen that the stiffer the belt or the smaller the pulley diameter the less able is the belt to conform to the pulley rim. Therefore, when a belt slips it may be due solely to too thick a belt being used, and in this event the cure for the trouble is to apply a thinner belt, which is practically always capable of transmitting more power under the conditions. Another very important detail is the method of fastening. Too much stress cannot be given to the fact that any metal fastener must be applied strictly in accordance with the manufacturer's instructions. Any variation from absolute accuracy is bound to lead to unsatisfactory service. If leather lacing is preferred, this also should be applied with the utmost care. The holes should be punched so small that the lace is a push fit, and they should be equidistantly spaced across the belt. In pulling the lace through it is imperative to ensure that each hole takes its fair share of the tension, or the belt will run dog legged. Contrary to most opinions, transmission belting does not require a high degree of skill on the part of the plant engineer. It is largely a matter of studying effects and seeking corresponding causes. When this is done regularly complete satisfaction is almost certain to result.

Automatic Regulators

THE Chemical Engineering Group of the Society of Chemical Industry recently held a conference at which a number of papers on the subject of automatic regulators were read and discussed. Abstracts from those of chief interest to manufacturing chemists are given below:—

Control in Plant Design

By L. B. Lambert and H. R. Walton

[Abstract]

In the development of any new process the equipment in which it is to be carried out receives the first attention and great pains have been taken in the design of furnaces, stills, autoclaves, retorts, dryers, evaporators, and boilers. Factors such as pressure, temperature, flow and time have an important bearing on the process, and in order to control these factors and reproduce their values with the object of obtaining uniform results, they must be measured. Instruments and regulators have hitherto been regarded as auxiliary and secondary equipment, and for this reason less attention has been given to their co-ordination with other equipment. Many regulators are not operating at their maximum efficiency simply because their addition to the plant had not been foreseen when it was installed and the result is an unsatisfactory compromise. The regulator should measure what it is controlling. The makers of measuring instruments and regulators are frequently faced with the problem of selecting the suitable points and conditions of measurement in plant which has already been designed and for which regulators and instruments have been considered only as an afterthought. Select a position in a pipe or duct for the measuring device where the stream of flow is reasonably free from turbulence, if accuracy and consistency of measurement is to be obtained. It frequently happens that piping and ducts have been designed without due regard to the position of the measuring devices; only available points give results which are not satisfactory, and the regulators cannot give the performance of which they are capable. A furnace, autoclave or retort may have been designed without any suitable provision for the insertion of a thermocouple or thermometer bulb or without consideration of such factors as radiation, flow past the measuring element or conduction losses. In these cases a location must be chosen which gives, at the best, only a comparative reading of the temperature of the medium under control; the regulator is handicapped from the start. There are still many processes, however, in which present-day standards of precision, uniformity and speed of production cannot be secured without reliable automatic controls, and yet the design of the primary or essential plant in which the process is carried out has remained practically unchanged, except with regard to size and capacity. Examples are given of typical average conditions and others of co-ordination in plant design where controllability has been a major factor.

Temperature, Pressure, and Flow

By W. J. A. Copeland

[Abstract]

To ascertain the actual manufacturing cost of any article, the cost of operating the steam plant should be taken into consideration. This can only be done if instruments such as pressure, temperature, CO_2, steam, water and coal meters are installed and used intelligently. In the case of steam distribution, flow meters should be installed to ascertain the exact amount of steam supplied to each department. Pressure-type thermometers are used to measure temperatures between 300° F. and 1,200° F., liquid gas vapour and mercury fillings being used. The use of corrosion-resistant materials for bulbs or measuring elements has increased in recent years. Stainless steel is being used for both bulb and capillary tubing in mercury filled systems. Resistance thermometers, which can be either of platinum or nickel wire, are being replaced for temperatures above 300° F. by thermocouples. The latter are cheaper and less subject to contamination when used in industry. Nickel resistance thermometers are being widely used for temperatures below 300° F., and where a quicker response than can be obtained with the pressure-type thermometer is required. Greater accuracy of these temperatures is possible with this type of thermometer than with a thermocouple, because the resistance thermometer can be made to cover much narrower ranges. Thermo-electric pyrometers with either base metal or rare metal thermocouples are used more widely than any other type of temperature measuring instrument. Potentiometer-type pyrometers, although developed some years ago, are now coming into their own; the wider chart and incidentally greater accuracy is a great advantage. Radiation and optical pyrometers are used mostly for very high temperatures, above, say, 1,500° C. Photo-electric cell pyrometers have now been developed for measuring the temperature of hot moving bodies. The sensitivity of this type is so great that it responds to a change of temperature in less than half a second for the full scale. There are two types of flow metres, the mechanical and the electrical. For the industrial plant the orifice plate of the present day is sufficiently accurate for all practical purposes and does not take up as much room as the Venturi tube. The mechanical type of meter incorporates the meter body, or Venturi tube for measuring the differential across the orifice plate, and the indicating or recording mechanism. With this type it is necessary to locate the whole of the meter near the orifice plate installed in the pipe line. The electrical type employs an electrical telemetering system for transmitting the movement of the mercury in the meter body to the recording or totalising instrument. This type has a great advantage over the mechanical as the reading instruments can be located in the central control room, whilst the meter body can be located near the orifice plate. Another type of flow meter is the area or constant head, which is finding wider application for the measurement of viscous fluids and chemical solutions. The early types of "On-Off" control applicable to batch processes may produce such severe changes in the case of continuous processes that the process would become unbalanced. Various control methods have been evolved to overcome this difficulty, including the so-called floating and throttling controllers, sometimes with automatic reset.

Electrical Control of Chemical Processes

By A. D. Elmsly Lauchlan, M.A. (Cantab.)

[Abstract]

This paper is concerned mainly with the consideration of the control of chemical processes in aqueous solution at temperatures which in general do not greatly exceed 100° C. The principal deciding factor in the choice of an electrode system is the *p*H range over which it is desired to control the process, and the second factor is the accuracy permissible to ensure adequate control. In the following table the more usual electrodes are tabulated, showing the *p*H range over which they will work:—

Electrode	*p*H Range
Hydrogen	... Whole *p*H scale
Quinhydrone	... Up to *p*H 7.5
Antimony	... 2-13 *p*H
Glass	... Up to *p*H 10

The hydrogen electrode has the virtue of giving the highest accuracy under most conditions, but it is not without its faults. The coating of platinum black must be replaced frequently, and it is very susceptible to the presence of colloidal matter, which causes it to become sluggish. For these two reasons alone it has rather fallen out of favour for general control tests, being replaced by some of the other electrodes; but where interfering substances are absent, it does give excellent results. The quinhydrone electrode is extremely popular, as it gives trustworthy results in all solutions up to *p*H 7.5 and is very simple to use. Its chief limitation is that it cannot be used in a solution of *p*H greater than 7.5. Both the above electrodes are capable of giving results correct to 0.02 *p*H under ordinary conditions, which is usually more than sufficient for most control purposes. If greater accuracy is required, temperature control of the electrode system is essential. The antimony electrode has of late become known outside the research laboratory, and it promises to be even more popular than the quinhydrone electrode since it can be used over a range from 2-13 *p*H. It is true that it is not quite as accurate as either the hydrogen or the quinhydrone electrode, but it is not easily "poisoned" and requires very little attention to keep it in good working condition. The electrode must be calibrated at two or three

points when a wide *p*H range is being investigated; the error in measurement is not generally greater than 0.05 *p*H for ordinary work. Although it is less accurate, the antimony electrode is well worth considering on account of its great simplicity. In order to deal with materials which cause trouble with hydrogen, quinhydrone, and antimony electrodes, a very satisfactory form of glass electrode is available. This electrode system is undoubtedly the best for all solutions where the *p*H value will not rise above 10. Colloidal matter, oxidising agents, such as free chlorine and hypochlorites, do not affect it. When considering a fully automatic control installation the following should be investigated carefully:—(1) The volume of the mixing tank; (2) buffer capacity of the solution; (3) position of control valve; (4) position of sampling point; (5) concentration of reagent to be added; (6) possible changes of temperatures. The first five points primarily decide the best type and size of valve to be used to obtain the maximum accuracy of control while the last only affects the general accuracy over the whole range of the controller.

Automatic Control in the Chemical Industry

By A. Callender, M.A., A. B. Stevenson, B.Sc., A.M.I.E.E.

[Abstract]

In the majority of valves, dampers, rheostats, etc., the controlling influence is not linear with movement of the correcting device. It is possible to overcome this difficulty by measuring the change in the controlling influence for a given change in the device at various positions, and by interpreting these results in the form of a cam of such shape that its lift will, at all positions, be proportional to the effect of the device on the variable. Even if action be taken at the correcting device immediately any deviation occurs, this deviation will grow unchecked for the duration of the time-lag. Automatic control should, without excessive valve movement or rapidity of working, be able to stop a fluctuation before it has developed to more than twice its inevitable value, and subsequently to damp the oscillations to a comparatively small value in not more than two complete cycles. It has been possible to devise a control apparatus which fulfils the conditions which can be applied to a large variety of practical control problems. Among the possible applications of automatic control in chemical industry are distillation, filtration, drying, maintenance of *p*H, conductivity, humidity. Various forms of hydraulic apparatus analogous to the basic mercury form have been designed. These depend on the principle that fluid pressure can replace the static head of mercury, a pipe line the cord and pulleys, and the reservoir of mercury can be replaced by a sump of fluid placed at the highest point of the system. The pressures can be made to expand or contract a bellows or diaphragm, and the capillary resistance can be changed to an adjustable leak into the sump. A completely hydraulic form of the apparatus can be constructed if the disturbance of equilibrium between the indicating instrument and the bellows is made to operate a hydraulic pilot valve. Another analogue to the basic apparatus is the electrical one. Clearly an electric potential is comparable with the static head of mercury or with fluid pressure and can be used to cause current to flow through a resistance, while electric quantities can be stored in condensers. This analogue is probably the most important of all for chemical and industrial problems. It has various advantages in that the source of potential can be connected more easily to the control unit than can a piston or cam, and such potentials can be easily amplified by means of thermionic valves. In practice, with this form of control unit, correspondence between the indicator and the apparatus generally takes the form of a balance between two potentials. The variable to be controlled is measured in electrical terms as a changing potential by any one of several methods, and this potential is applied to the grid of one triode valve while a corresponding potential is applied to the grid of a second triode.

Other papers contributed at the conference were:—"Simple forms of Automatic Regulators," by Dr. Ezer Griffiths, F.R.S.; "The Installation Factor in Automatic Controls," by D. Harrison; "Applications and Limitations of Self-Operating Temperature Regulators," by B. T. Wingfield; "Automatic Control of Chemical Processes," by Dr. W. A. Clark; "The Influence of the Characteristics of a Plant on the Performance of an Automatic Regulator," by Dr. A. Ivanoff; "Experiences of the Use of Instruments as Aid to Plant Control," by E. I. Lowe, B.Sc., and J. Frisken, B.Sc., A.M.I.

Rust-Proofing

Since its introduction thirty years ago the phosphate process for treating steel surfaces to provide a rust-resisting finish has found an increasing number of applications by virtue of steady improvements in efficiency. A survey of the present position is given in "The Metallurgist," December 25, 1936. The process depends on the property of certain acid phosphate solutions of forming an insoluble protective film on steel, but it was early recognised that the range of conditions for getting the best results was rather narrow. Richards, working in Coventry in 1911, had shown advantages for the use of an acid manganese phosphate solution, and later, about 1916, his patents, together with those of others, were taken over by the Parkers in America and developed into the Parkerising process.

The Parkerising Process.—The Parkerising bath consists of a solution in water, about 3 per cent. strength, of "Parker powder," which is essentially manganese dihydrogen phosphate together with some iron dihydrogen phosphate. The solution is contained in an iron tank and is kept heated practically to the boiling point by steam coils. The steel articles to be treated, free from scale and oily matter, are immersed in the solution. At first, evolution of hydrogen gas occurs from the surfaces, but after a while this practically ceases, the parts becoming covered with a thin greyish-coloured coating. Treatment is usually complete in about an hour. The process may be considered as interaction between the outer surface layer of the steel with the dihydrogen phosphates in solution yielding an adherent layer of the mono-hydrogen phosphates of iron and manganese together with some neutral phosphate; this can be symbolised, with the omission of the manganese phosphate, thus:—

$$Fe + Fe(H_2PO_4)_2 = 2FeHPO_4 + H_2.$$
$$2FeHPO_4 + Fe = Fe_3(PO_4)_2 + H_2.$$

The bath is maintained by the addition of more Parker powder as required, according to an analytical test consisting in titration of a sample with standard alkali solution. The parts are finished after phosphate treatment in a variety of ways depending on requirements, e.g., with the aid of oils, lacquers, or enamel coatings. It is to be noted that unless coated with an opaque material it is usual to render the greyish phosphate coating black by means of a dye applied as a solution in water or oil.

The Atrament Process.—This process is similar to the Parker process. A point of difference is that instead of powder the acid manganese phosphate is supplied in the form of a concentrated solution.

Rapid Processes.—In the Parker Company's Bonderising process a phosphate bath is used containing a copper salt as accelerator, the treatment requiring only a few minutes instead of about one hour. A rapid modified Atrament process is available. This has the advantage of working at a lower temperature, and the consumption of added phosphate solution is less than in the regular process. The American Chemical Paint Company, in the Granodine No. 30 process, employs a zinc phosphate bath and applies alternating current to the parts under treatment. The Parcolite process avoids the necessity of immersing the articles in a tank; a viscous phosphate preparation is applied to the surface by spraying and the layer is dried in an oven at 107° to 177° C.

The Phosphate Process in Russia.—Tests have been carried out with phosphate powders available in Russia. Two powders, viz., "Digophat" (from the Chemischen Fabrik, of Dsershinsk) and "Zim" (from the Zentralen Metallforschungsinstitut, of Leningrad), were found to be closely similar in chemical composition to Parker powder (P_2O_5, 49.2 per cent.; Mn, 14.6 per cent.; Fe, 2.7 per cent.) and gave phosphate coatings on steel showing little difference in protective power from those formed with the aid of Parker powder.

Among the various factors liable to give defective phosphate coatings are the presence of traces of grease not removed from the surface of the steel in the initial cleaning, too low a working temperature or incorrect composition of the solution. The cleaning treatment given to the steel prior to phosphatising has an important effect on the coating produced. The best method for removal of scale is mechanical cleaning, such as sand or emery treatment.

Wrapping Machinery

THE advent of wrapping machinery coincided roughly with the coming of the petrol engine and the motor-car, said Mr. Frederick Grover, M.I.Mech.E., in a paper recently presented to the Institution of Mechanical Engineers ("Proceedings," Vol. 132). In 1896 there were only sixteen motor-cars on the register, and it is doubtful whether there were as many wrapping machines in the world. Mechanical inventions follow the needs of industry, which are, in turn, dictated by popular demand. For instance, the advent of wrapping machinery in America may be said to have been occasioned by the whimsical desire of a vast population to chew a flavoured gum. At this time no one in Europe was interested and the machines were unknown. The first commercially successful machine in Europe for wrapping small pieces of chocolate in tinfoil was made in Leeds in 1901, and several such machines were supplied to the English and Swiss chocolate makers which worked at a speed of 100 pieces per minute with two operators. The first machine, which is illustrated in Fig. 1, was constructed with a chain feed for carrying the cut sheets of foil into the required position. The uppermost section of the chain was about 4 ft. long and was arranged with suitably spaced pins projecting upwards into a slotted channel. Separate sheets of foil were placed by hand between the pins. The sheets of foil were supplied (to the hand feeders) in the form of solid cut blocks as the foil came from the guillotines, and the separation of the individual sheets was difficult and, moreover, they were sadly creased by handling. To feed 100 wrappers a minute required four feeders, which was a serious drawback. The obvious remedy was to procure the foil in reels and cut the sheets automatically to the required size. But not one maker in Europe could at this time supply foil in roll form. In America only one maker was considering the matter. Strips could be obtained up to 24 in. in length, so that with a 3-in. length of cut the operator placed eight wrappers at once, thereby increasing her capacity eightfold. One feeder then sufficed instead of four. After giving details of the arrangement Mr. Grover said this device worked very satisfactorily for a short time, but it was not possible to attain a very high degree of accuracy either in the spacing of the cuts or in the hand placing of the strips. The consequence was that the leading edge of the strip arrived at the knife a trifle too early or too late.

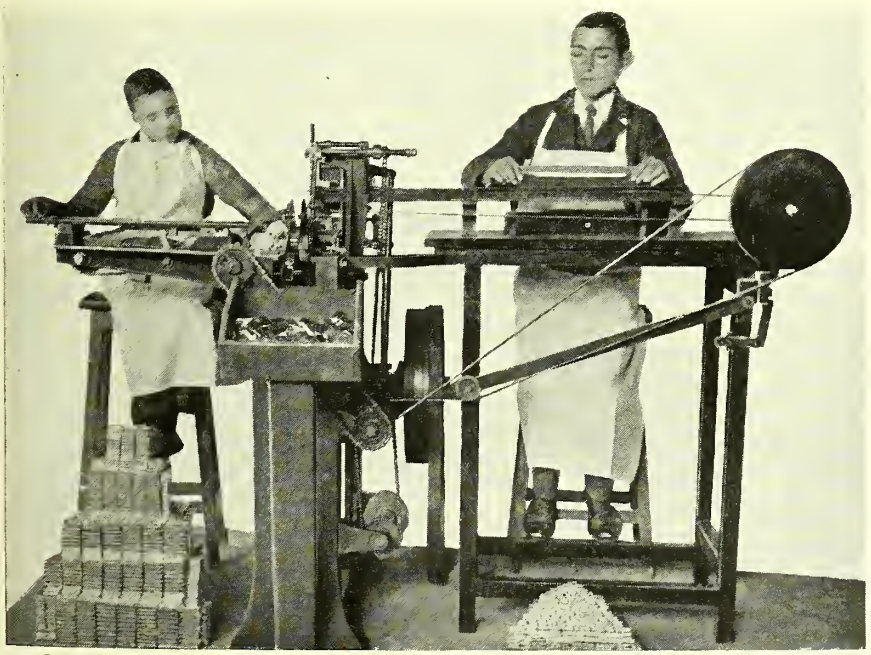


FIG. 1.—*The first chocolate wrapper used in Europe*, 1901–2

Factors in Design

A broad line of distinction may be drawn between the mere design of mechanism to imitate the movements of the hands

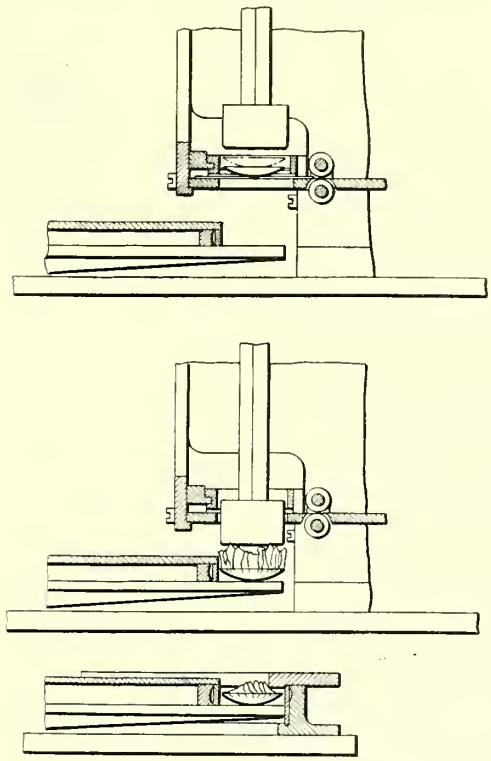


FIG. 2.—*Diagram of plunge mechanism*

in forming folds of paper round an object of a certain shape, and some novel and more efficient means adapted to the shape of the article and to the nature of the wrapping material—a means which departs from tradition, and which could not be performed by hand. Generally speaking, contributions of this latter character have been the potent factors in the stream of progress. Consider, for instance, the case of a thin round disc to be wrapped in a foil covering, and then a rectangular block wrapped in paper. It may be imagined how this would be done by hand. To perform the operations by machine it is conceivable in the first example that if a square of foil is placed on a smooth plate, having a round hole in it slightly larger than the disc, and the disc then placed on the foil so that it is exactly coincident with the hole, the disc may be forced through the hole by a plunger whose diameter is about equal to that of the disc (Fig. 2). In passing through, the foil will be turned upwards fitting closely round the plunger until it is free from the surrounding wall, when it will fall of its own weight in the form of an open-topped cylindrical receptacle, with the disc at the bottom. Foil being ductile, one can imagine the upstanding walls of the temporary open box being spun over the surface of the disc to

form a complete container. The simplest way of doing this, and at the same time of removing the disc from the path of the following one, is to provide a rotating platform like a revolving flange upon which the successive discs will fall and be carried. The flange may be provided with an inner wall close to the rim of the disc. As the disc is carried along on the flange it may enter an annular space formed between the inner wall of the flange and a stationary concentric outer wall so spaced that the distance between them is rather less than the diameter of the disc. On entering the annulus, both sides of which are faced with rubber, the discs begin to rotate like epicyclic gears pitched a few inches apart and travel round towards an exit situated near the entry position. The mean diameter of the annulus with respect to the diameter of the discs may be such as to ensure the discs rotating on their own axes five or six times. By providing a spirally shaped blade attached to the stationary wall of the annulus and causing it to press against the upstanding foil, the latter is spun over the disc. It then leaves the annulus and passes between rollers, the upper one being of hard material and the under one of soft sponge rubber. The hard roller gives quite a good frosted appearance to the spun side, whilst the soft roller presses the foil on to the moulded side of the disc and gives quite a handsome lustre to the wrapped article. A machine of this kind was first made in Leeds and installed in a Swiss chocolate factory in 1904; since then it has been regarded as the standard machine for this kind of wrapping. It will be noticed that this is a case of special adaptation to the wrapping material to be used, namely, a ductile foil. Paper would be quite unsuitable, unless it were waxed and heat-treated in the folding. Such means, however, would probably damage the goods and hence be unacceptable. In the second example, namely, wrapping a rectangular body, the idea of pressing the block and the wrapper through an orifice which is just large enough to allow its passage is

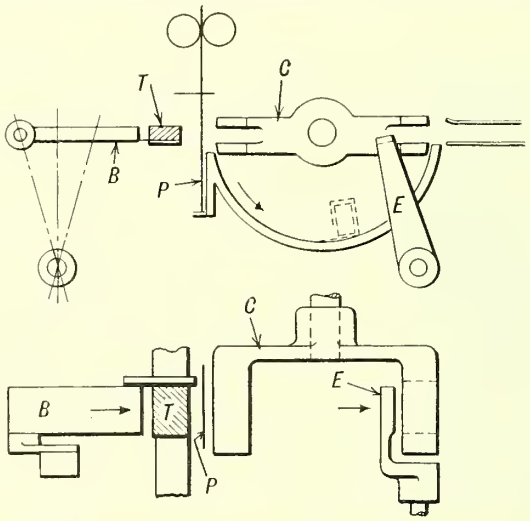


FIG. 3.—*Diagrammatic elevation and plan of wrapping machine*

again adopted, but in this case the wrapper must be coaxed into successive positions, eventually forming very definite creases along predetermined lines on the wrapper. For this reason the forming box is much more elaborate. It is found to be more convenient in this type of work to lift the block on a plunger until it reaches the wrapper and then carry both upwards through the folding box. During this upward movement the wrapper is neatly folded over the ends, and when

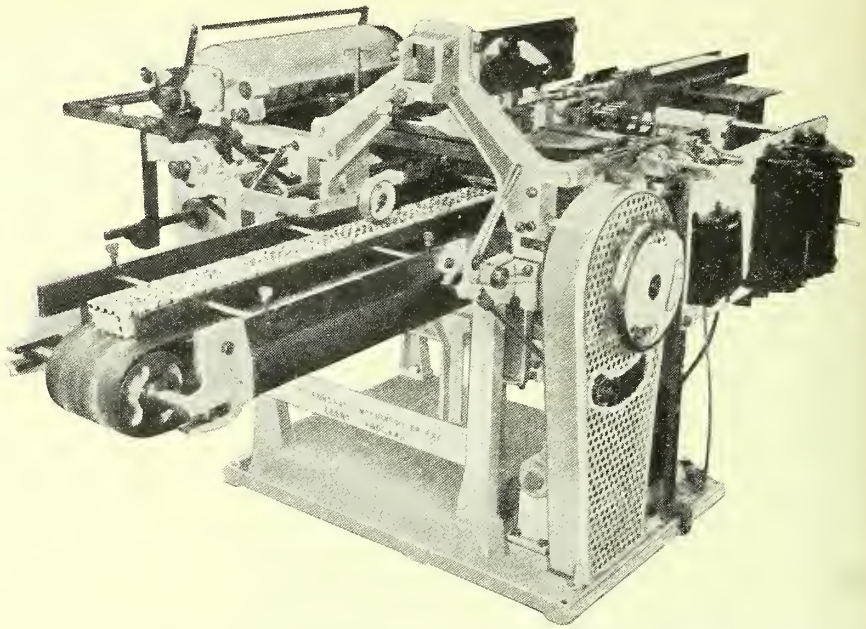


FIG. 4.—*Forgrove L.F.A. Machine. Adjustable for wrapping packages in glassine, cellophane, waxed back foil or paper wrappers cut from a roll with photo-electric registration of printed wrappers if required*

it emerges from the box parts of it are hanging down closely embracing the plunger. In this case we have an inverted container with the block at the top and a sort of skirt hanging below. The block is held by the grippers when it arrives at its top position so that the plunger may be withdrawn and the under folds completed. The efficiency of this method is appreciated when it is realised that during an upward movement of about 4 in. through the folding box the wrapper is first creased along eight well-defined lines almost simultaneously, and afterwards four outstanding wings are turned through an angle of 130 deg. with great precision and without mutual interference. When the wrapper is waxed a plate heated to about 145° F. may be pressed against the under folds and so seal them by melting the wax. Otherwise the application of a spot of gum on the last fold may be desirable. This illustration differs from the first rather elementary example in that the folding box gives equally good results with any kind of wrapping material capable of taking a sharp crease. A thick brown paper can be folded as accurately as a flimsy web of transparent cellulose. Whilst the devices which have been considered—and many more examples could be given—may be described as the heart and lungs of a wrapping machine, they are after all only a small part of the body politic.

Synchronising of Movements

All machines derive their action from a shaft rotating at constant speed. The problem of the designer is to convert rotary motion into reciprocating movements of a specific character, and into other rotary movements with varying periods and "dwells." Finally, there are endless combinations that may be effected by mechanical means. In this class of machinery the external work done is insignificant, and hence wear and tear is the result of internal forces causing the motions of the parts themselves. In all mechanical actions, such, for instance, as the familiar crank and connecting-rod and the perhaps less familiar Geneva motion, there are definite positions where the acceleration of the driven part has its maximum value and other well-defined points where there is no acceleration. On the other hand, a cam movement may be made which will give a constant acceleration, thus equalising the wear. When high speeds are required it is specially important to allot the times to each movement so that no disproportionate rate of change of motion occurs in one element, which would mar the otherwise rhythmic action and set up severe local stresses in an overdriven member. To state the problem more precisely, let us imagine that three separate movements have to be synchronised, represented by 4, 9 and 36 units of length to be traversed by the respective parts in one

cycle of the machine. The operating times would be in the proportion of 2, 3 and 6, and the cycle would contain 11 parts. In a cycle of 360°, 65°, 98° and 197° should, therefore, be allowed for the respective movements. The simplest way of obtaining a reciprocating movement is by means of the crank and connecting-rod, and wherever possible this gives the cheapest form of control. But the movement occupies the whole cycle and cam movements are therefore also very generally used. A to-and-fro straight-line movement can be derived from a continuously rotating crank which does give a moderate period of dwell at one end of its stroke. When a folding movement is travelling with unvarying speed, the force required to maintain it is merely that needed to overcome frictional resistances. The force to be applied to change the speed of movement depends upon the rate of change and the weight of the part moved, and the question arises whether these changes should be impressed upon the reciprocating part by making the relevant arc of the cam acording to the harmonic curve or the so-called gravity curve. The latter form is preferable.

Making a Chart

In allocating the time allowable for all the movements of a machine, the principle already indicated may be applied to groups of associated motions with the object of usefully distributing the periods so that no one movement is unnecessarily violent. As soon as the main movements in a machine have been provisionally determined, they should be plotted on a chart. The horizontal base of this chart should represent a machine cycle in degrees of arc, and vertical measurements in inches should represent the position of each moving part at all points in the cycle. For a given speed of working the horizontal base represents time to a determinable scale. Consequently, the slope of the movement curves on the chart will represent the velocities of the moving elements at any point chosen for examination. From the movement chart a velocity chart can be constructed. Similarly, the various slopes on the velocity charts can be plotted to give an acceleration chart. In this way an analytical picture of the working is obtained, which may profitably be studied by the designing staff. The elements referred to above are illustrated in Fig. 3 in elevation and plau. T is the tablet to be wrapped ; the bar B pushes the tablet against the paper P into the jaw formed on the carrier C. The paper is partially folded on entering the jaw, and the movement of the carrier folds the paper as illustrated in the intermediate position. When the tablet is pushed from the carrier it is entirely enclosed in a tubular wrapper with the ends open. The chart deals with these four movements. It will be noted that the carrier completes its movement in about 240° of the cycle of 360°. As the carrier comes to rest the tablet is pushed over from the feed belt into the jaws of the carrier. At the same time, the ejector E passes through the other pair of carrier jaws and dwells in a position clear of the jaws. As the jaws rotate the ejector passes between the two pairs of jaws when they are approaching and passing by the vertical centre line. The paper begins to move downwards slowly until the pusher bar B is drawn back from the path of the paper. From such charts the cams are all indexed and the correct timing is obtained by erecting to the index marks.

In Fig. 5, C is a shaft rotating at constant speed. A and B are fixed fulcrum pins. The point P is chosen on the connecting-rod with reference to the shape of the locus of its path. Having determined this a link P D is chosen of such a length that when it swings on the pin D its upper end will, within certain limits, describe a path coincident with the locus of the fixed point on the connecting-rod. A slider attached at E will, therefore, reciprocate horizontally, but the slider will be stationary between the points L L_1. Some ingenious wrapping machines have been made using this type of gear instead of cams, and it has been claimed that they are superior because they are quieter and are less liable to inaccuracy of movement due to wear. Turning to movements that do not allow the driven member to overthrow in consequence of its momentum as with the ordinary pawl and ratchet—the commonest example is the well-known Geneva motion. Where such gears are of frequent application it is useful to prepare office charts giving the motion of the driven wheel in terms of the angular

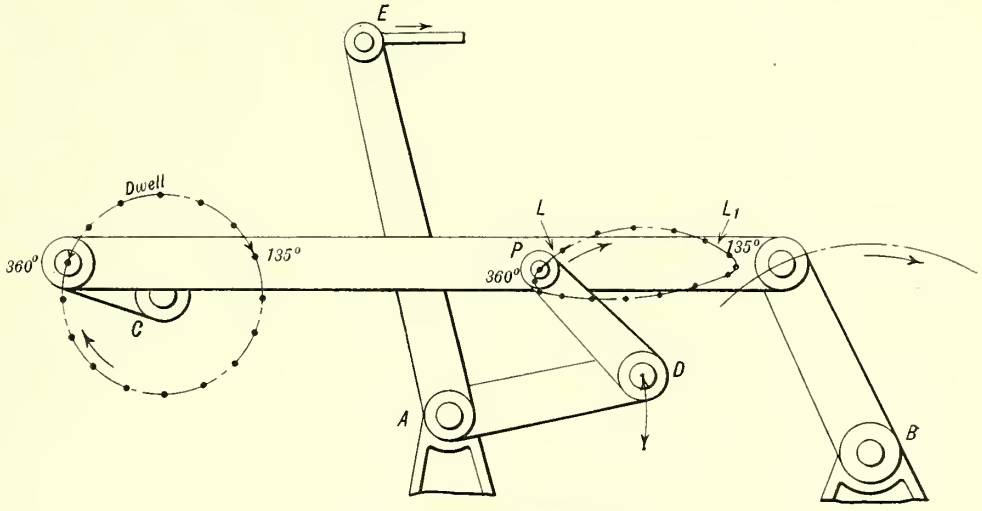


FIG. 5.—*Crank-driven motion*

movements of the driving shaft so that at every position the movements can be plotted on the general timing chart.

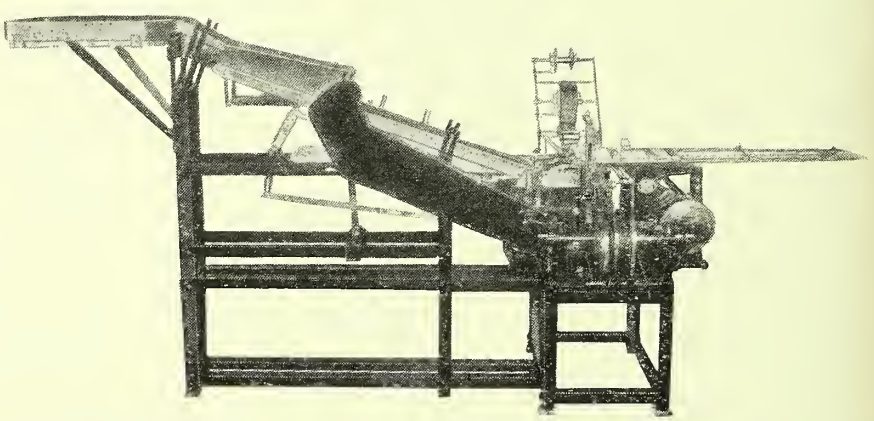
Feeding Factors

A great deal of ingenuity has been expended on feeding delicate webs of paper, tin, or aluminium foil from rolls, and cutting and registering them, so that a design printed on the foil at spaced distances keeps its correct relative position on the objects being wrapped. When rolls of tin and other foils became available, the problem of paying out the foil from a heavy cylinder of practically solid tin had to be faced. The tensile strength of a strip of foil is small; the roll may weigh 10 lb. or more and have a comparatively large moment of inertia. The problem is how to set this mass of metal in motion by the tangential tension on the strip without breaking it. Whatever the safe tangential tension may be, its moment about the reel centre gradually becomes less as the foil is used. The moment of inertia also becomes less. Whatever the diameter of the reel may be, the moment of inertia falls away faster than the turning moment. Hence the tangential starting effort from rest on frictionless bearings does not increase as the roll diminishes both in radius and weight. This may be all very well when the roll is mounted on frictionless bearings, but if that were the case when once the roll was put in motion, it would continue to pay out foil whether it was wanted or not. For this reason some braking action is required which will increase if the roll pays out too much, and diminish if it pays out too little. Moreover, the braking action must be controlled so that the tension on the web of foil is to all intents and purposes constant and well within the breaking stress. The major factors in the problem appear to be (1) that the tension on the web must be relatively small, (2) that the foil reel should be mounted on bearings as frictionless as possible, (3) that a variable brake should act on the foil spindle so that the restraint shall weaken as the turning moment diminishes, and (4) that the regulation of the brake pressure should depend entirely upon the amount of web paid out at any particular time. The most significant departure in design of pay-out gears arises from the use of very heavy reels with long lengths of cut. When reel feeds were first fitted to wrapping machines it was customary to display names on the wrapper by printing them in close repetition in some rather jumbled-up form, so that wherever the web was

cut the names appeared on the face of the tablet with an appearance of uniformity. But some manufacturers were not satisfied with this, and elected to wrap by hand, using separately printed sheets displaying their advertising in panel form over the face of the tablets and thus giving a much more distinguished appearance to the product. It will be realised that a printed wrapper fed from a reel by intermittent rollers or any other means cannot be relied upon to keep in register with the tablets. This demand, therefore, opened up an entirely new situation as regards wrapper feeds.

Registering Apparatus

Registering apparatus for continuous strip control with perforated holes may be divided into methods functioning (1) purely mechanically, (2) mechanically but with air pressure control, and (3) electromechanically. In the first the essential feature is that a pin or the point of a light pawl is made to enter the perforation as the web comes to rest. This can always be done by making the pin, say, half the diameter of the hole, because no single variation from hole to hole will exceed $\frac{1}{32}$ in. What is being attempted is to prevent an accumulation of small errors. Having engaged the pin, the web is momentarily released from all other restraints excepting that of the pin, and a very slight drawback pressure is applied so that the forward edge of the hole is always brought into contact with the pin. In mechanical control actuated by air pressure the web of paper is drawn over a partially exhausted chamber having on one side a flexible diaphragm which is contracted by the partial vacuum. So long as the hole in the web does not stop over the opening over which the web is travelling nothing happens, but as the paper creeps forward the air rushes through the small port, the diaphragm dilates, and operates on the feed so that the next cut is slightly shorter. In the third method—electromechanical—the paper is used as an insulator for a low-tension current and two contacts are spaced just slightly wider apart than the diameter of the perforation. These are lowered on to the web every time it stops. If the paper is in the correct position neither contact will complete the circuit. If the paper advances, the forward circuit is energised and an electro-magnet pulls over the control bar, say, to the right. If the paper lags behind, the other circuit comes into play and the bar is pulled over to the left. These differential movements are easily made to regulate the feed, and have the advantage that the correction of positive or negative feed is working about a central point which represents the precise length of wrapper. In consequence of this feature the control is much closer to the mean length wanted. Some controls are made to act only one way. In these gears the web is given a slight bias in the forward direction and when the several positive errors add up to say, $\frac{1}{32}$ in., a trip operates so that $\frac{1}{16}$ in. is taken off the next cut. The error is thus controlled to within $\frac{1}{32}$ in. of the mean length. All the gears described necessitate a perforated web. In the case of the light cellulose webs now in use, printing and perforating is not easy, and in consequence of this an entirely new method is adopted which depends upon the action of light on a photo-electric cell. These cellulose wrappers are transparent, and a beam of light focused on the web will pass through it and set up a minute current in the cell placed on the other side of the sheet. This is amplified, and relays set up more current so that magnets may be operated and levers moved to effect changes in the feed. The great advantage of this form of control is that some opaque part of the design printed on the web can be used as the registering point. When the web used as a wrapper is itself opaque the light beam and the cell are placed on the same side of the wrapper. The beam is projected at an angle of 45°, and its reflection is caught by the cell, which is as near as possible to the focus point. The change in the quantity of the light reflected from a white and a dark surface is sufficient to operate the cell. This form of control is not convenient in all cases on account of the confined space, but usually the control by transmitted light can be very easily arranged and is perfectly satisfactory. Mechanisms for feeding cut sheets stacked in a vertical or inclined hopper fall into two main categories, namely, (1) those taking the sheet from the top of the pile, and (2) those taking it from the bottom of the pile. The latter scheme has the advantage that the hopper can be replenished whilst it is working, but its use is limited to small sheets. In cases where the superposed stack is heavy it becomes impracticable to drag out the bottom sheet, although in some cases this difficulty may be alleviated by arranging for a slicing blade to enter the stack above the bottom sheet and so support the weight. Even this is unsatisfactory for sheets approaching a square foot in area, and in such cases it is therefore usual to feed from the top. In either case the question of separating the sheets has to be considered and means provided for taking only one sheet at a time. This becomes impossible for flimsy fabrics of a sticky nature, such as waxed paper, and only substantial grades can be used. In separating the sheets considerable use is made of the fact that the friction between rubber and paper is much greater than the friction between sheets of paper. For instance, if a pair of rubber pads press lightly on the top sheet of a pile of sheets hemmed in with walls on all four sides, and if the rubbers are moved towards one wall, they will carry the top sheet with them and buckle its edge against the obstructing wall whilst the sheets below remain straight. If then the rubbers stop and the obstruction is caused to collapse, the buckle will straighten out, making the edge of the sheet project beyond the pile so that it can be carried away by suitable grippers. Or again, if instead of a retaining wall to create a buckle two needles are placed about an eighth of an inch from the back edge of the sheet and are made to penetrate through five or six sheets, the rubber will drag the top sheet out by pulling it through the needles, but the friction between the top and second sheet is not sufficient to drag out the second sheet from the needles. When this method is used the damaged side of the label is always concealed by being folded inside. Another principle, namely, air suction, is much used, both on printing machine feeds and on wrapping machines. In all these uses it is essential that the sucker be applied to the corners or edges of the sheet so that every chance is afforded for the inlet of air between the sheets. Another means of lifting the top sheet is by pressing gummed surfaces vertically downwards on to the pile and then lifting the sheet that sticks to the surface. The gum is applied where it is wanted to attach the label to the tablet. In most other cases the gum is applied by drawing the single sheet over a narrow roller immersed in a gum pot and projecting therefrom through a narrow slot which scrapes off all but a thin film and deposits it on the paper passing over.



A fully automatic machine for wrapping square lozenges, tablets and similar products is illustrated above. The tablets are filled in the hopper on the left-hand side, from which they are automatically arranged and counted to the correct number per packet, the wrapping being done in an inner wrapper consisting, for instance, of wax-backed aluminium cut from the reel and a printed label taken from the stack and gummed in the length. Up to 60 packets are turned out per minute. This machine has been developed by the Société Industrielle Suisse, of Neuhausen (Rhine Falls, Switzerland), represented in Great Britain by Paillard & Benoit (SIS) Wrapping Machines, Ltd., London, S.W.1. A similar machine, type DRO, will wrap round tablets and drops in the above style in cellophane with twist ends.

Air Conditioning

WHEN air conditioning is mentioned most manufacturers think of costly equipment. This is probably true in certain cases, but there are in existence two types of conditioning plant. The one which is mostly in mind is the central system. In this all plant and machinery, including heaters, refrigerators and washers, is situated centrally in the works, and conditioned air is distributed through ducting. The other system, which is of more recent development, is known as the unit system. These small units can be utilised in offices, flats and sections of factories. In America the small size plant has been used to condition the air on long-distance trains. It is probable that air conditioning has become popular in the United States because of the extremes of temperature and weather conditions to which the country is subjected. In England we do not suffer from such extremes, but nevertheless there are certain manufacturing operations associated with the drug trade which cannot be efficiently carried out on days of high humidity. For a proper understanding of the value of conditioned air a definition of the process is necessary. It can be defined as the production of the required atmospheric conditions in a building by treatment of the air supplied for ventilation. The methods employed include filtration, warming or cooling, and increase or decrease of humidity. Within limits any range of temperature and humidity can be obtained. The most important unit of any air-conditioning plant is the washer. This can be used for humidifying or dehumidifying the air as required. The air leaves the washer in a saturated condition at the temperature of the wash water. On heating to the temperature desired for the building a definite humidity at that temperature is attained. The tobacco manufacturing companies have long recognised the value of controlling the humidity of the air in their factories in order to send out their products in first-class condition. They are fortunate in having essentially one product to consider, and the whole of the factory can be treated in much the same manner. The textile and confectionery industries have also been active in applying air conditioning to their factories.

Pharmaceutical Problems

The drug industry is in quite a different position. Thousands of different products are made, and the large variety of processes used makes it almost impossible for a general system of air conditioning to be applied throughout a pharmaceutical factory. In would obviously be absurd to go to the expense of conditioning the air of a galenical manufacturing laboratory, as the presence of large and varying amounts of steam and water would immediately change the state of the air in such a room. Again, it is customary for alcoholic percolations to take place in cool, draughtless rooms, and these conditions can be obtained without elaborate equipment. There are, however, several branches of pharmaceutical manufacture where air conditioning can be of the greatest value. These include the manufacture of capsules, of tablets, of pastilles and in the preparation and packing of salines. Pharmaceutical manufacturers have long made use of heated air and of fans for blowing this heated air over products to be dried. Very little serious effort, however, has been made to control the velocity and humidity of the air. With correctly conditioned air for a particular process considerable saving of steam and power can be effected, and many processes which are almost impracticable on days of high humidity can be carried out all the year round. A good example is the manufacture of tablets. The general principles of tablet making are well known to pharmacists, so they may be briefly outlined as follows:—The granules are dried in hot air chambers, and when dry are removed for sifting and lubricating. If these granules are brought from the drying cupboards into an atmosphere which is saturated with moisture it is obvious that in most instances they will immediately commence to absorb water. If they are exposed for any lengthy period it is not always possible to make satisfactory tablets. In addition the tablet-making machinery (if the room is allowed to cool overnight) forms a condensing surface for the moisture in the air. Controlled temperature and humidity are, therefore, of the greatest importance in this branch of manufacture. In saline making the granules are dried in heated chambers or cupboards of various designs, generally with a current of air being blown over them. The air used should be dried before being passed over the granules in order that the drying cupboards can work at maximum efficiency. An even more important aspect in the preparation of salines for the market is the condition of the atmosphere into which the salines are brought from the drying chambers. Should this air be saturated the saline will absorb moisture and a certain amount of interaction will take place between the acid and alkaline constituents. It is essential, therefore, that the filling rooms should have a correctly conditioned atmosphere. In addition it must be borne in mind that the bottles or tins used must be quite dry and must not be filled with saturated air. They should be removed from the drying machines and transferred immediately into the packing atmosphere.

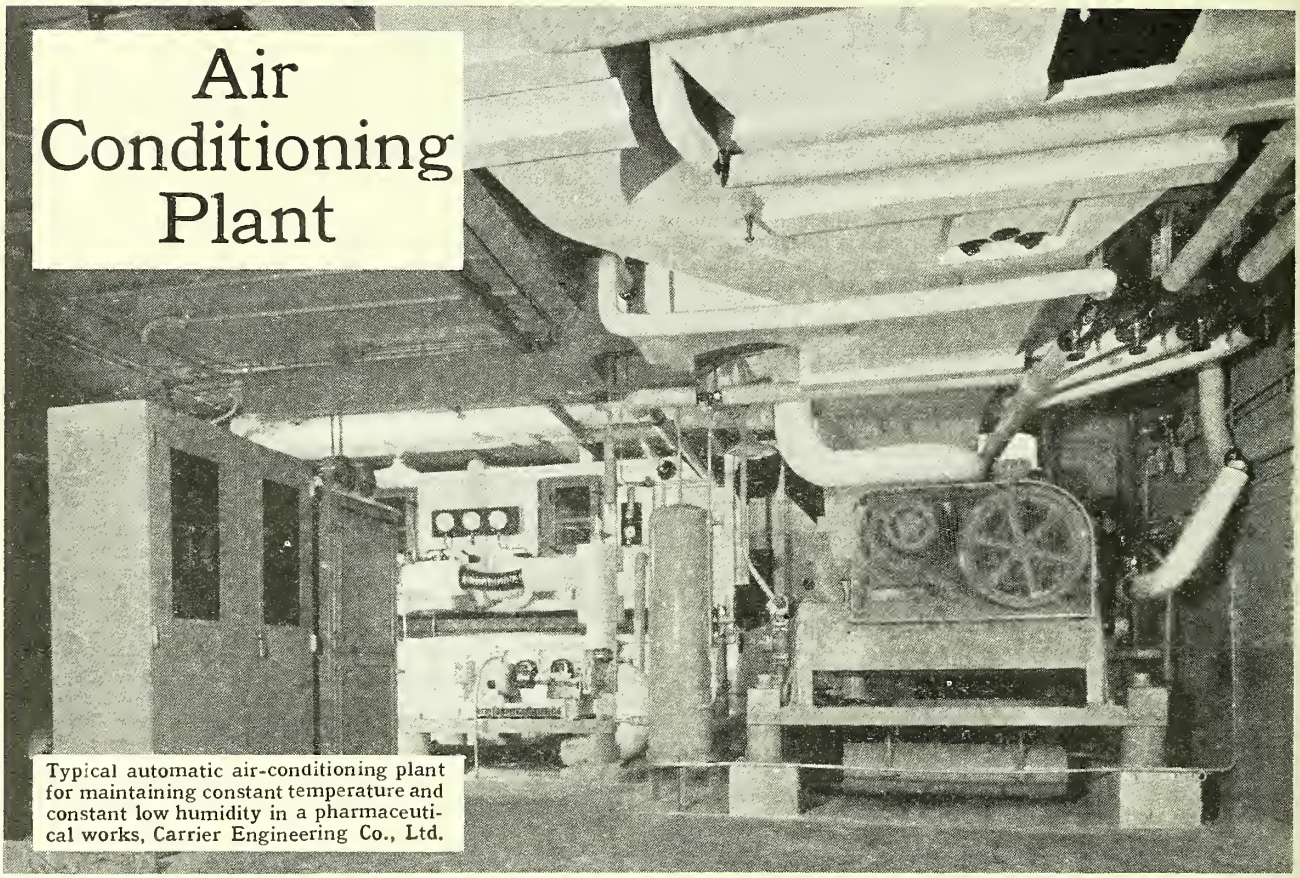
Difficulties with Gelatin

Similar conditions of manufacture are necessary in the preparation of capsules and pastilles, especially in the case of pastilles where the base is principally gelatin. The general method of manufacture of gelatin capsules by the pressure process is sufficient to give an example of the need for correctly conditioned air in the manufacture of products containing a high proportion of gelatin. A gelatin mass is made—the exact formula for this mass varying in different factories. This mass is melted and is poured on to amalgamated tinned steel plates in sheets of uniform thickness. These sheets of gelatin on the plates are then placed in drying cupboards to set. In the simplest type of drying cupboard steam radiators alone are used, and it is clear that general atmospheric conditions will affect the rate of drying of the gelatin sheets. At this stage conditioned air—that is, air of the right temperature and of low humidity and moving with a definite velocity over the sheets—is of great advantage. Uniform drying can be obtained on 365 days in the year with conditioned air. It is customary to pour the gelatin sheets late in the day and allow them to dry at night. When the sheets are taken from the drying chambers they are placed in racks and allowed to stand for a definite period before being stripped off the plates and used for making the capsules under pressure. Under ordinary conditions, unless the press room is kept at a very high temperature (a temperature very unpleasant for the operatives) the sheets absorb moisture on days of high humidity. With conditioned air no such difficulties would arise. The finished capsules are also very susceptible to changes in the moisture content of the air and on certain days it is almost impossible to handle them under ordinary atmospheric conditions. Complete conditioning of the air of a capsule manufacturing and packing department greatly simplifies manufacture, and production is uniform all the year round. Certain engineering difficulties arise, as the temperature and humidity required varies in different sections of the department, but these difficulties can be overcome by the companies who manufacture up-to-date plant. What has been said about capsules applies in a general way to pastilles. Of interest to the pharmacist is the fact that one of the largest companies of invalid food manufacturers has its factories equipped with air-conditioning plant.

There are several important makers of air-conditioning plant who are prepared to advise on the use of their equipment in special circumstances. It should be remembered that to obtain success from the installation the fullest experiments should be carried out in advance so that the engineers have complete information to work on before the plant is installed. For a number of industries tables have been prepared by responsible engineers showing the optimum conditions of temperature and humidity, and these tables are available for anyone who contemplates installing air-conditioning plant. Partial conditioning has been found to be of very great value in many cases, and as this involves considerably cheaper installation it is rather surprising that it has not been adopted in more cases. When the correct type of plant is installed it is found by experience that it fulfils the supreme requirement in industry—it more than pays for itself.

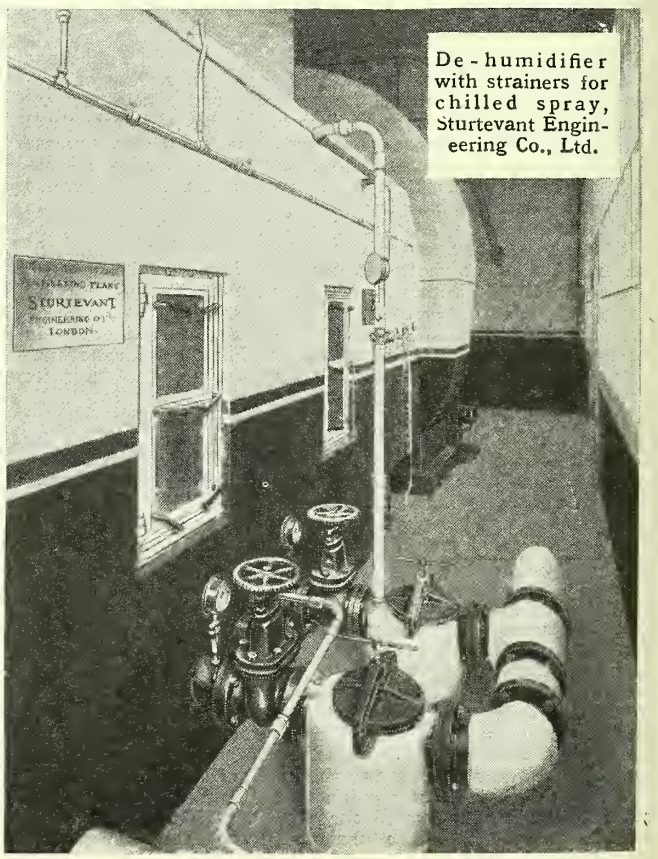
SCHOLARSHIPS AT PLYMOUTH.—Under the will of Dr. Joseph S. Pearse, of Plymouth, half the residue of the estate is to be devoted to scholarships and prizes in chemistry and certain other subjects. The amount is approximately £2,400.

Air Conditioning Plant



Typical automatic air-conditioning plant for maintaining constant temperature and constant low humidity in a pharmaceutical works, Carrier Engineering Co., Ltd.

Fan and motor of air-conditioning plant installed by Sturtevant Engineering Co., Ltd.



De-humidifier with strainers for chilled spray, Sturtevant Engineering Co., Ltd.

Copper in Chemical Plant

THE uses of copper in plant and machinery devised for chemical processes are attractively set forth in a book entitled "Copper in Chemical Plant," issued by the Copper Development Association, Thames House, Millbank, London, S.W.1. With the aid of numerous illustrations the technical advantages and the limitations of this metal are concisely indicated; we have noted a few passages of special interest to our readers.

The opening paragraphs of the book deal with the physical properties of copper, and in particular with its high degree of resistance to corrosion under a wide range of conditions. The following table is useful:—

Atomic weight	63·57
Sp. gravity	8·93
Melting point	1083°C.
Thermal conductivity ...	0·92 cal/cm²/cm/°C./sec. 0·74 B.Th.U./sq. ft./in./°F./sec. 222 B.Th.U./sq. ft./ft./°F./sec. 2670 B.Th.U./sq. ft./in./°F./hr.
Specific heat	0·092
Coeff. of thermal expansion ...	$16·6 \times 10^{-6}$ per °C. $9·22 \times 10^{-6}$ per °F.
Electrical resistivity	1·7241 microhms per cm³ at 20°C.

The corrosion of metals depends upon such a number of factors that it is impossible to make any general statement which will correctly indicate their behaviour in particular cases. Numerous laboratory tests have been devised from which relative corrosion values have been ascribed to various materials; but even when these have been carried out under conditions approximating as closely as possible to those existing in a plant, it is found that they are not by any means an infallible guide to the behaviour of such materials in service.

Behaviour in Contact with Various Substances

After this general statement the behaviour of copper in contact with several substances and in varying conditions is discussed. The following are typical paragraphs:—

WATER.—Normal water supplies have no action on copper, as an oxidised superficial tarnish soon develops which acts as a protection to the underlying metal; for this reason copper pipes and tanks are very extensively employed for water services. Waters which are acid in character, such as those derived from peaty areas, may prevent the formation of a protective film, and therefore very slight dissolution of the copper may take place. In the majority of cases, however, such waters are treated with lime at the source to neutralise the acidity, as without such treatment they have a much more serious solvent action on the other metals used for water services. The practice of tinning copper pipes used for such acid waters is only to be recommended if pure tin is used for the operation.

AIR.—Dry air has no action on copper at normal temperatures. Under ordinary atmospheric conditions copper becomes slowly tarnished with an oxidised film, which changes in time to a mixture consisting mainly of basic sulphate and carbonate. This mixed salt is normally green, and forms the well-known patina of copper. As it is adherent and non-hygroscopic, it serves as a further protection to the underlying metal, and it is owing to this fact that so many copper and copper alloy articles made thousands of years ago are still in such a good state of preservation.

FLUE GASES.—Flue gases, whether from solid, liquid or gaseous fuel, always contain sulphur oxides and oxygen, but the corrosion resistance of copper is usually adequate in these cases, as condensing conditions rarely obtain.

HYDROGEN AND CARBON MONOXIDE.—At temperatures below dull red heat tough pitch copper is resistant to attack by these reducing gases, while deoxidised copper is unaffected at still higher temperatures.

CARBON DIOXIDE.—This gas has no action on copper in the dry state. In the presence of moisture the action is very slow and the resulting product, as in the case of atmospheric action, forms a protective skin. Liquid carbon dioxide is without action on copper, which is therefore employed when this agent is used to produce refrigeration.

CHLORINE.—Copper is rapidly attacked by this gas. Copper pipe is, however, satisfactorily used for water which has been sterilised by chlorination.

AMMONIA.—Readily attacks copper, which should therefore be avoided in the presence of this gas. Ammonium salts, however, such as the sulphate, are satisfactorily treated in copper equipment if free ammonia is absent.

ACETIC ACID.—The main sources of acetic acid are crude pyroligneous acid (from wood distillation), fermented liquors such as vinegar, and the more recently developed synthetic processes. On account of its high resistance to corrosion copper equipment is very extensively used in the production and applications of this acid. In its manufacture such items as evaporators, stills, rectifiers, condensers, piping and storage tanks are all made of copper, while pumps, valves and other cast parts are usually made of bronze.

LACTIC ACID.—Copper evaporators are used to concentrate the dilute aqueous solution of the acid obtained by acidifying the calcium lactate prepared by bacterial action on molasses or lactose in presence of lime.

TANNIC ACID.—This acid is extracted from various tree barks and is largely used in the leather and printing industries. These extracts are very susceptible to discoloration by iron, and therefore the extractors, evaporators, finishers, piping, etc., are all made of copper, which is resistant to attack by this acid.

FORMIC ACID.—Copper is widely used where this very corrosive acid is being manufactured and handled.

FATTY ACIDS, such as stearic, palmitic, oleic; and other organic acids such as phthalic, salicylic, gallic, oxalic, benzoic, various fruit acids, etc., are all treated satisfactorily in copper, and equipment made of this metal is used in the preparation of numerous derivatives.

ALKALIS.—Copper is very satisfactory for use with solutions of soda and potash except in high concentrations, when monel metal can be recommended.

OTHER CHEMICALS.—Copper is used in industries handling inorganic salts, but under such varied conditions that consultation with a manufacturer as to suitability in a given case is desirable. It should not be employed, as a rule, when solutions of salts are oxidising agents. It is unaffected by hydrocarbons. In the synthetic production of methyl alcohol copper-lined alloy steel chambers are used. Other chemicals in the production of which copper vessels or copper-lined vessels are usual are ethyl acetate, butyl acetate, amyl acetate, cellulose acetate, acetone, formaldehyde, chloroform and ether.

Evaporators and Stills

Much ingenuity is shown in the construction of evaporators, various types of which are illustrated in the Association's book. Copper finds extensive use in all types of heat transfer apparatus owing to its high heat conductivity and resistance to corrosion. The heating may be direct by the combustion of fuel or indirect through the intermediate agency of steam. Among instances of direct heating may be cited varnish kettles, essential oil stills, and some spirit stills. Where moderate temperatures are required, steam is very widely used as a heating agent, as by its use over-heating is avoided and temperature control is greatly facilitated, while its high latent heat provides on condensation a very convenient means of efficient and rapid heat transfer. The motive force for evaporation in such kinds of apparatus is the temperature difference between the steam introduced for heating and the boiling point of the liquid. A general working minimum is 15° F. In the case of a solution, the presence of the solute raises the boiling point of the solvent and thereby diminishes the available temperature difference, and the greater the concentration of the liquid the higher the boiling point for any given substance. The difficulty is generally overcome by working the evaporator under vacuum, generally of the order of 26 to 27 in., which reduces the boiling point of the liquids and thereby increases the available temperature difference. For many solutions which would be adversely affected by the normal boiling temperature the use of vacuum is essential in

order to lower the temperature of evaporation. There are various devices for economising in steam. Copper, brass and bronze are extensively used in the construction of evaporators.

Stills present other problems. As is well known, fractional distillation necessitates more elaborate apparatus than ordinary distillation. When practicable, the heating medium is steam, and by the employment of suitable means very accurate control of temperature is possible. The distillation of a liquid at a temperature below its normal boiling point can be effected by passing a current of steam through it. Copper equipment is used in distilling a great variety of substances. The following are examples:—

INDUSTRIAL ALCOHOL.—The industrial demand for alcohol for use as a solvent, as a raw material for the manufacture of esters, and more particularly as a constituent of motor fuel, has increased very rapidly in recent years. In addition to the cereals used in the production of potable spirits, molasses, potatoes and many other vegetable sources of carbohydrates are used for the manufacture of industrial spirit. Molasses has the advantage of being ready for fermentation without further change, whereas the potato starch has first to be transformed to sugar, which is effected by the action of malt on the pulped mass produced by the action of pressure steam on potatoes in an autoclave. Fermentation is then carried out in large copper fermenting tuns with yeast until the alcohol content is from 6 to 10 per cent. The "wash" thus produced is then distilled for the production of alcohol.

OILS AND FATS.—The oils and fats used in the soap and candle industries and in the manufacture of fatty acids and glycerin are glyceryl esters of various fatty acids, of which the most commonly occurring are stearic, palmitic, oleic and linoleic. These esters are converted by hydrolysis into free fatty acids and glycerol either by prolonged boiling with dilute sulphuric acid in the presence of a catalyst or by heating under pressure in an autoclave with steam and a small percentage of lime or other base. The autoclaves for the latter process are usually made of copper, as the presence of traces of iron in the resultant fatty acids would be disadvantageous. Copper is commonly used both for the stills and condensers owing to its high heat conductivity.

GLYCERIN is obtained from soap lyes and sweet waters by concentration in vacuum evaporators frequently fitted with copper tubes, and during this process many of the impurities are removed. Final purification of the glycerin is carried out by distillation under high vacuum; the condensing equipment for this operation is sometimes tinned copper, particularly if glycerin of a high degree of purity has to be obtained.

VARNISHES, RESINS, ESSENTIAL OILS, ETC.—The natural hard resins such as copal and amber must be heated in order to render them soluble in some solvent medium before they can be utilised for varnish manufacture. The heat necessary for this is high enough to dry-distil a portion of the resin, and the operation is therefore frequently carried out in small copper stills with condenser attached. After heating is completed the cooled resin is dissolved in the appropriate solvent, e.g., turpentine, linseed oil, petroleum fraction, etc., and filtered, copper being the supporting metal for the filter medium. Copper plant is preferred because it is advisable to use every precaution to prevent overheating. Similar considerations have led to the widespread use of copper kettles for boiling linseed and other oils for the paint industry.

ESSENTIAL OILS AND PERFUMES may be obtained by steam distillation of the flowers, or by solvent extraction of the essential oil and subsequent removal of the solvent by distillation. The stills and condensers are generally made of copper.

TURPENTINE is obtained by distilling the sap of certain conifers. The distillation may be carried out in copper stills to prevent overheating and consequent loss of colour of the resin which forms the still residue.

Pharmaceutical Society of Great Britain

London Examination Results

THE following are the results of the examinations held in London during January:—

	No.	Preliminary Scientific Examination				Chemist and Druggist Qualifying Examination			
		Absent	Failed	Referred	Passed	Absent	Failed	Referred	Passed
Entered for Prelim. Sc. exam. ...	224	4	123	53	44	—	—	—	—
Referred subject in Prelim. Sc. exam.	145	1	—	70	74	—	—	—	—
Entered for C. and D. exam. ...	131	—	—	—	—	4	68	38	21
Referred subject in C. and D. exam.	85	—	—	—	—	—	—	15	70
	585	5	123	123	118	4	68	53	91

Candidates have been referred as follows:—Botany, 90; chemistry, 22; physics, 11; pharmacognosy, 5; pharmaceutics, 23; physiology, 5; pharmaceutical chemistry, 15; forensic pharmacy, 5; total 176.

Candidates have failed as follows:—Botany, 115; chemistry, 112; physics, 82; pharmacognosy, 35; pharmaceutics, 58; physiology, 30; pharmaceutical chemistry, 56; forensic pharmacy, 33.

The following candidates have satisfied the examiners in the Chemist and Druggist Qualifying examination:—

Armstrong, Sidney, Penge
Austin, Clifford, Swansea
Bagwell, W. E., Cardiff
Barwick, Frank, Croydon
Beaumont, L. C. Margate
Benbow, G. H., Beckenham
Bessell, E. R., Westcliff
Biggs, H. H. A., Southsea
Blumenthall, S. J., E. London
Bottoms, Frank, Oldham
Bromwich, J. E., Tipton
Cartwright, D. F., Cradley
Cheal, G. P., Seaford
Chipperfield, R. E., Beckenham
Clarke, B. I., Liverpool
Clarke, George, Leeds
Clarke, A. V., Edgbaston
Conway, William, Waenfawr
Cook, William, Doncaster
Coombs, Albert, Altrincham
Cooper, F. W., Fulham
Corker, A. E., Harrogate
Crompton, T. W., Pendlebury
Davies, E. G., Cardigan
Davies, Mervyn, Porth
Dearden, A. L., Chilwell
Edmonds, A. H., Oxford
Fair, R. J., Sheffield
Fordham, J. R., Tollesbury
Foreman, E. V., S. Farnborough
Forster, F. A., Norwich
Gee, R. E., Manchester
Griffiths, J. R., Aberayron
Griffiths, J. R. S., Llwynypia
Gutteridge, G. D., Rochdale
Hardie, D. L., Liverpool
Hare, Charles, Birkdale
Harrison, Peter, Sleaford
Harwood, A. R., Oxford
Haywood, J. S., Stone
Henderson, Kathleen B., Shepherds Bush
Herrick, G. D., Loughborough
Hill, D. F., Leicester
Hodgson, Eric, Shipley
Hopkins, J. H., Bristol
Hoyle, A. F., Fulham
Hutchinson, W. P., Alfreton
Johnson, Edgar, Widnes
Jones, E. W., Crewe
Jones, E. E., Wolstanton
Jones, G. L., Aberavon
Jones, G. J., Barry Dock
Jones, Thomas, Swansea
Keeble, L. E., Mile End
Kings, L. J., Coventry
Knight, E. D., Wincanton
Lamey, Catherine A., Devonport
Lees, Ivy M., Ramsbottom
Leslie, Kathleen M., Stratford
Livesley, Eric, Hayfield
Livie, D. McL., Potton
Lukey, J. R. Ll., Portland
McKeand, K. J., Blackburn
Maxwell, Frank, Nelson
Molson, J. R., Spalding
Morgan, D. R., Merthyr Tydfil
Morgans, E. Ll., Bronant
Murgatroyd, C., Littleborough
Nicholls, Arthur,, Bestwood
Noble, E. C., Peterborough
Nurick, Myra G., Cricklewood
Oversby, Joan M., Prestwich
Robertshaw, B. A., Nelson
Robinson, E. J., Scarborough
Rothwell, G. G., Bolton
Sandford, H. B., Plymouth
Shaw, Alan, Sheffield
Slater, D. G., Wigan
Smith, J. R., Warrington
Smith, O. H., Doncaster
Staton, Herbert, Mobberley
Stevenson, Lily, Coventry
Thom, H. W., Manchester
Thomas, I. H., Llanelly
Thompson, A. W., Thames Ditton
Towler, N. A., Chorley
Whitehead, S. E., Darfield
Widdicombe, N. S., Manchester
Williams, A. E., Dudley
Williams, J. S., Wallasey
Withington, T. W., W. Bromwich

Products of Ceylon

The following information is given in the annual general report for 1935 of the Director of Commercial Intelligence, Colombo:—

Cinnamon.—There was an improvement in the trade in this commodity during the year under review, 38,888 cwt. of quills and 7,537 cwt. of chips valued at Rs. 435,491 and Rs. 54,525 respectively were exported during 1935 as against 38,165 cwt. quills and 6,081 cwt. of chips valued at Rs. 1,124,884 and Rs. 38,063 respectively in the previous year, showing an increase in value and quantity. Mexico increased her purchases of quills by 25 per cent. in quantity. The quantities and value of exports for the last six years were:—

Year	Quantity		Value	
	Quills	Chips	Quills	Chips
	Cwt.	Cwt.	Rs.	Rs.
1930	35,915	8,234	1,683,713	96,270
1931	35,261	6,680	1,115,756	61,628
1932	40,166	8,101	948,518	44,380
1933	41,224	7,445	954,573	32,710
1934	38,165	6,081	1,124,884	38,063
1935	38,888	7,537	1,435,491	54,525

Arecanuts.—Exports increased in quantity by 3,314 cwt. with a corresponding decrease in value of Rs. 104,857 compared with the previous year. British India and Maldive Islands are the chief buyers. 85 per cent. (79,051 cwt.) was taken by British India and 7 per cent. (7,024 cwt.) by the Maldive Islands. The average price for the year under review was Rs. 9.83 per cwt., while that of the previous year was Rs. 11.05 per cwt. The following statement gives details of the exports during the last four years:—

Year	Quantity Cwt.	Value Rs.	Year	Quantity Cwt.	Value Rs.
1932	99,185	1,399,815	1934	90,069	995,555
1933	104,725	1,285,134	1935	93,383	890,698

Cardamoms.—2,362 cwt. were exported during 1935 as compared with 3,441 cwt. during the previous year, a decrease of 29 per cent. United States of America (312 cwt.), Aden (293 cwt.), Japan (232 cwt.), United Kingdom (191 cwt.), Denmark (108 cwt.) were the chief buyers. Purchases by Germany show a gradual decrease (323 cwt. in 1933, 162 cwt. in 1934, and 87 cwt. in 1935).

Plumbago.—Exports advanced from 231,385 cwt. valued at Rs. 1,654,681 to 278,165 cwt. valued at Rs. 2,064,518. Japan, who was the largest buyer in 1934, was replaced by the United States of America during the year under review. United Kingdom comes next (United States of America 88,800 cwt., Japan 82,820 cwt., United Kingdom 51,669 cwt.). The following table shows the quantity and value of plumbago exports since 1930:—

Year	Quantity Cwt.	Value Rs.	Year	Quantity Cwt.	Value Rs.
1930	174,478	1,775,317	1933	191,173	1,213,561
1931	134,413	1,225,331	1934	231,385	1,654,681
1932	122,009	1,023,283	1935	278,168	2,064,518

Citronella oil.—There was a decrease in the exports of this commodity from 1,527,868 lb. valued at Rs. 803,829 to 1,399,764 lb. valued at Rs. 686,418, a decrease of approximately 8 per cent. in quantity and 14 per cent. in value. The chief buyer was United States of America, followed by the United Kingdom, Germany, and Australia. The average price fell from 55 cents in 1934 to 48½ cents in 1935. The exports of citronella oil for the last five years were as follows:—

Year	Quantity Lb.	Value Rs.	Year	Quantity Lb.	Value Rs.
1931	1,203,482	940,298	1934	1,527,868	803,829
1932	1,270,801	1,202,918	1935	1,399,764	686,418
1933	1,459,423	1,273,832			

Exports of cinnamon (leaf and bark) oils during 1934 totalled 2,796,636 lb. valued at Rs. 374,508, and 249,197 lb. valued at Rs. 233,234 in 1935. Exports of papain in 1934 totalled 103,778 lb. valued at Rs. 590,849 and 155,274 lb. valued at Rs. 638,516 in 1935. Plantations, in acres, at the end of 1935 were: Arecanuts, 69,000; citronella, 33,000; cinnamon, 26,000; cardamoms, 6,000.

New Books

Morgan, G. T., and Burstall, F. H.—*Inorganic Chemistry, A Survey of Modern Developments.* 6 in. × 9 in. Pp. 462. 15s. W. Heffer & Sons, Ltd. [An amplification of three lectures embodying a survey of modern inorganic chemistry delivered at the Institute of Chemistry. This work puts on record the most recent discoveries in inorganic chemistry. The elements are discussed in periodic groups, one to eight, and an exhaustive account is given of the progress made in regard to transmutation of the elements. Special mention is made of the isotopes of hydrogen and of the recognition of heavy water as a normal constituent of ordinary water. The theory of co-ordination and the chemical structure of inorganic compounds are lucidly and concisely explained. The systematic arrangement of this treatise renders it of especial interest to the student.]

Finding the Media. 8¼ in. by 13¼ in. 21s. Smith's Advertising Agency, Ltd., 100 Fleet Street, London, E.C.4. [The third of a trinity of books of marketing "discovery," which includes "Finding the Buyer" and "Finding the Market." This volume contains a tabular analysis of the Press of Great Britain, giving publication dates, price, latest press date, circulation figure where known, page size, column width, block screen and price of advertising space; a classification of newspapers into various groups; and local statistical information under counties. The newspaper classification is not above criticism; it places The Chemist and Druggist, for example, under "Scientific and Engineering," instead of under "Trade and Technical," which latter heading, curiously, takes in "The Engineer." Undoubtedly, however, the book contains much valuable information for advertisers, advertising managers and agents.]

Le Rossignol and Holliday.—*A Pharmacopœia for Chiropodists.* 7½ in. × 5 in. Pp. 160. 5s. Faber & Faber, Ltd., 24 Russell Square, London, W.C.1. [This book is divided into two main sections: drugs used in chiropody and surgical dressings used in chiropody. There are accompanying chapters on pharmacological terms and on pharmaceutics. An appendix gives apothecaries' weights and measures. Under each of over 100 monographs in the main section there are subsidiary paragraphs on preparation, characters, action and uses, and (the word is used ambiguously) preparations, of which over 150 are named. The chapter on surgical dressings gives brief descriptions of the common dressings and the raw materials from which they are prepared. The book provides authentic information on all the medicaments that the chiropodist is likely to use in his work, and others less likely to be encountered. One of the authors is a pharmacist.]

Blake, A. E.—*Planned Retail Advertising.* 8½ in. by 5½ in. Pp. 199. 7s. 6d. Blandford Press, Ltd., 16 Hyde Street, London, W.C.1. [This book is informative, particularly on the subjects of copywriting, layout and what is called "direct appeal" advertising. There are thirteen chapters, and the other subjects dealt with include analysing the sales problem; planning the campaign; media and space; illustration; outdoor advertising; and minor forms of retail advertising. The author knows what he is writing about and writes clearly, but some of his remarks and illustrative examples may have the result of discouraging small advertisers. Thus, the first reference to any space smaller than half-page is the statement: "It takes brains to make an occasional 11-in. triple memorable." Maybe it does, but the small shopkeeper must perforce choose between attempting it with even smaller spaces and spending a sum of money out of all proportion to the immediate results to be expected. At 5s. per single column inch, which is a common enough rate among local weekly newspapers, an 11-in. triple costs £8 5s., and the chemist reader may wonder whether even the most attractive advertisement can pay its way in sales of his own low-priced stock. If, on the other hand, he has been so successful with his advertising that he has taken gradually increasing spaces in his local paper, it may well be that he is already familiar with much of the information to be found in the book. Perhaps he has even made such progress that he can employ an advertising agent and leave everything to him. The reader who takes up the book should, therefore, set out with the intention not to be awed by this "big-space" attitude. He will then find, when he has mastered it, that he is adequately equipped with sound and readily applied knowledge with which to advertise his business.]

Vegetable Waxes

AN article of unusual scientific and technical interest occupies twenty-four pages of the Kew "Bulletin of Miscellaneous Information," No. 10, 1936. The author is Mr. F. N. Howes, M.Sc., a member of the staff of the Royal Botanic Gardens. The article commences with a survey of the occurrence of waxes in plants: it is pointed out that in many cases the quantity formed is so small as to be only of scientific consequence. The best-known instances where wax occurs in sufficient quantity on the leaf surface to warrant collection are perhaps afforded by the palms, particularly the carnauba wax palm, *Copernicia cerifera*, Mart., and the wax banana of the East Indies. Instances of wax development on the stem are well exemplified in certain species of *Euphorbia*, especially *E. cerifera*, Alc., the source of candelilla wax, and in the wax palm of the Andes, *Ceroxylon andicola*, H. & B. In many of the taller growing grasses and most varieties of sugar cane, wax is very noticeable on the stems and leaf-sheaths, particularly in the vicinity of the nodes. Wax development on the stem is also conspicuous in some varieties of the castor oil plant (*Ricinus*) and on the stems of certain species of *Rubus*, notably *R. biflorus*, Buchan., and *R. Giraldianus*, Focke, natives of the Himalayas and China respectively, and sometimes cultivated as ornamental plants. In these two species of *Rubus* the wax coating is sufficiently thick to render the stems vividly white in appearance as if whitewashed, noticeable particularly in the winter months when the leaves have fallen. In addition to its occurrence on leaves, stems and fruits, wax may also occur in appreciable quantity on the floral organs of some species. Although wax appears usually on the outer surface, it does sometimes occur and remain in the inner tissue. The following paragraphs give in abstract the author's descriptions of vegetable waxes that occur in fair quantities or have been utilised by man in some part of the world.

A Family of Root Parasites

BALANOPHORA.—The *Balanophoraceæ* are an interesting family of root parasites that occur chiefly in tropical and sub-tropical mountainous regions in Asia and South America. The best-known in respect of wax content are some that occur in the mountainous districts of Java, notably *B. elongata* Bl., *B. globosa* Jungh. and *B. Ungeriana* Val. The first-mentioned of these is reputed to produce the most wax and occurs at altitudes between 2,000 and 3,000 metres. The wax occurs in the parenchyma of the rhizome and is present in such quantity that when dried and ignited, the rhizomes burn brightly. They have been used by natives in Java as sources of illumination, candles or small torches being made from them. It is doubtful whether the plants occur anywhere in sufficient quantity for the wax to become an article of commercial importance.

BROSIMUM.—A so-called wax, cow tree wax, has been described as being obtained from *Brosimum Galactodendron*, D. Don, the cow tree of the South American forests. It is of soft consistency, somewhat transparent when fresh, and can be kneaded with the hands. Its superficial resemblance to beeswax may have earned for it the name of cow tree wax. Actually the material consists mostly of resin. This substance has been used for torches by the inhabitants of the areas where the tree occurs and has also been considered for chewing gum manufacture.

CEROXYLON.—The wax palm of the Andes, *Ceroxylon andicola*, H. & B., which bears a thick coating of a waxy substance on the bole, occurs at altitudes between 2,000 and 3,000 metres. It has a limited distribution, occurring only in western tropical South America. The yield of a single palm is about 25 lb., and to fell and scrape two palms is said to constitute a day's work for one man. After collection the wax or wax dust is melted and clarified, or boiling with water may be resorted to. It is an article of commerce among the inhabitants in parts of Colombia. Before being made into candles by the inhabitants, it is usually mixed with about a third of its weight of tallow. Crude ceroxylon wax as scraped from the palm trunk contains a large proportion of resinous material mixed with it. It would appear that a distinct or varietal form of this palm may be present in some parts of Colombia.

COCOS.—Wax has been shown to be present in the sediment which collects on the bottoms of tanks in which coconut oil, from *C. nucifera*, Linn., has been stored. Tanchico found the purified product to have a melting point of 88° to 90° C. The crude coconut oil residue, after removal of oil, dust and other impurities, was used in combination with other materials in making trial lots of "floor wax," "furniture polish" and "leather polish" which were found to be satisfactory. Little appears to be known regarding the yield of this waxy residue from coconut oil, and it is said to vary considerably.

COPERNICIA.—Carnauba wax, which is commercially the most extensively used of the true waxes of vegetable origin, is obtained from the leaves of *Copernicia cerifera*, Mart., a palm occurring in north-eastern Brazil. (For general characters of this wax see *C. & D.*, 1925, I, 524.) It is stated that in very dry years the yield may be only one-tenth of that obtained when conditions are favourable. According to figures quoted by Dahlgren for a grove in the district of Fortaleza in Ceara for the years 1921, 1923 and 1931 the average wax production was 6.9 gm. per leaf or 143.7 leaves worked per kilogram of wax obtained. This writer states: "The highest yield during the years in question was that of a third cutting in 1923, which gave 10.9 gm. per leaf. The lowest yield was that from the expanded leaves of the first cutting in 1921 which yielded an average of only 4.3 gm. per leaf." Serious attempts at the cultivation of the Carnauba palm on a large or commercial scale in other countries do not appear to have been made. The palm has been introduced to various parts of the tropics for experimental cultivation, chiefly in botanical gardens. It has been grown in British Guiana, the East Indies, East Africa, Ceylon and Malaya.

Candelilla Wax

EUPHORBIA.—The most important wax-yielding species of this large genus is *Euphorbia cerifera*, Alc., the source of the candelilla wax of commerce which is derived from Mexico. (The commerce in this wax was noted in the *C. & D.*, 1925, I, 439.) With regard to extraction, two methods are in use, (1) the old method by means of boiling water and (2) the more recent method of solvent extraction. The latter is more efficient in every way, for nearly double the percentage of wax is recovered and operating costs are lower. It is the method adopted in the more progressive and up-to-date factories. Many of these are owned or controlled by American interests. The percentage of wax obtained per unit of the fresh plant varies with plants from different districts, and it has been stated that in well-watered areas the yield of wax is less than in the more arid districts. It is also claimed that the character of the wax varies somewhat according to the age of the plants and the time of year when they are cut. There are other wax-yielding plants in Mexico of somewhat similar appearance to *Euphorbia cerifera*. One of these is *Pedilanthus pavonis*, Boiss., which may occur in the same areas and be known by the same common name. Two species that have attracted attention on account of the wax present are *Euphorbia xylophylloides*, Brongn., and *E. stenoclada*, Baill., both of which occur in Madagascar. These species have not, however, been exploited commercially.

FICUS.—Wax or wax-like substances have been obtained from the latex of certain species of *Ficus*, the best-known being the godang "wax" of Java. This wax, or so-called wax, is yielded by *Ficus variegata*, Bl., a large forest tree with a wide distribution over south-east Asia and common in parts of Java. It can be bleached, and has been sold in the bazaars for use in batik work and for candles. It has been shown that the so-called wax in the crude state consists mostly of resin, and that is hardly justifiable to term it wax.

LANGSDORFFIA.—This is another parasitic genus of the *Balanophoraceæ* which, like *Belanophora*, secretes wax freely. The solitary species of the genus, *Langsdorffia hypogæa*, Mart., has a wide distribution in Central and Southern America. It occurs chiefly at the higher elevations, and is reputed to be common in some of the mountainous areas of Colombia. The wax is present to the extent that if one end of a stem or rhizome be lighted, it burns as freely as a wax taper.

LINUM.—The outer epidermal layer of the stem of the flax plant, *Linum usitatissimum*, Linn., contains wax in appreciable quantity. This wax, which may be obtained as a by-product in the preparation of flax, has been prepared and

used for manufacturing purposes. Flax wax extracted from material grown in various parts of the world and under various conditions did not exhibit any marked differences in properties.

Musa.—Certain species and varieties of *Musa*, both wild and cultivated, form wax to a noticeable extent on the fruits, petioles, or under surfaces of the leaves. In one of the well-known cultivated cooking varieties of banana in Malaya (pisang abu) the ripe fruits, although actually yellow, are ashen in appearance owing to a well-developed waxy coating. A similar variety (abu kehel) showing profuse wax development on the fruits exists in Ceylon and is also popular for cooking. Throughout Java and Malaya wild bananas occur (forms of *Musa zebrina*, van Houtte, and *M. malaccensis*, Ridl.) in which the under-surfaces of the leaves are quite white owing to the presence of wax. In parts of Java this wax has been collected and utilised by the natives, but in Malaya this does not appear to be the case. It would appear that this so-called "banana wax" was better known and more generally used in Java in the past than it is at present, being a bazaar commodity in some areas and used in batik work. It is described as being hard, more or less transparent, and white, creamy yellow or light green in colour, according to the amount of chlorophyll that has become mixed with it. It breaks with a coarsely crystalline fracture and is easily powdered. Usually a good deal of fragmentary plant material, and sometimes insect remains, are present. The melting point is high (79°-81° C.), and no doubt various uses would be found for the wax if production on a larger scale were practicable. It is stated that the yield of wax in Java is approximately ½ kilo per 100 leaves.

Myrtles

Myrica.—Many species of *Myrica* bear a waxy coating or encrustation on the fruits, which is collected and utilised as wax in various parts of the world. The material is not a true wax, for it consists largely of glycerides and is more correctly regarded as a vegetable fat. Countries where the so-called wax myrtles occur freely and are exploited for "wax" are South Africa, North America, Mexico and Colombia. The "wax" obtained from the different species of *Myrica* in these countries is very similar in appearance and general properties. The chief use of *Myrica* "waxes" is for candle-making in the countries of production and as an adulterant of beeswax. Their relatively low melting point, generally between 40° C. and 45° C., no doubt precludes their more extended use for industrial purposes. Candles made from it from the Cape and from Colombia were found to burn slowly with little smoke but a rather poor light and to give off a somewhat balsamic odour. In South Africa several species of *Myrica* bear a waxy encrustation on the fruits and are capable of yielding "wax" in a greater or less degree. These species are for the most part evergreen shrubs occurring in sandy maritime areas in the south-western districts where they are sometimes very prevalent. *Myrica cordifolia*, Linn., is probably the best-known species and has the largest fruits bearing the most "wax." It is common in and around the Cape Peninsula and elsewhere in the Western Cape Province, where "berry wax" is a well-known commodity. Small quantities have in the past been exported to Europe and the United States. A soap of good quality and agreeable odour can be made from it, but the usual costs of production of the wax do not allow of its extended use in this direction. In North America the "wax" obtained from the fruits of *Myrica cerifera*, Linn., the wax myrtle, became an article of commerce in the early days of colonisation there and was exported. Another North American species with profuse "wax" development is *Myrica carolinensis*, Mill., the "small waxberry" or bayberry. In Mexico at least two species of *Myrica* are exploited for "wax." These are *M. mexicana*, Willd. (syn. *M. xalapensis*, H.B.K.), and *M. Pringlei*, Greenm. Wax myrtles occur in various other Central and South American countries.

Raphia.—The raphia palm of Madagascar, *Raphia pedunculata*, Beauv., which is the source of the raffia or bass so extensively used in horticulture and fancy work, bears a wax coating on the under-surface of the young leaflets. This wax has been collected and its properties investigated. Attention was first drawn to it in 1867. The yield of wax is relatively small, that from one experiment being 0.75 per cent. of the weight of leaves or 17 per cent. of the weight of raffia fibre extracted from them. The solidified raffia wax is yellow to dark brown or chestnut in colour, and can be readily powdered. It is hard and brittle and in many respects resembles carnauba wax in physical properties, although differing in composition. It possesses approximately the same melting point and exhibits the same behaviour with various solvents.

Rhus.—The fruits of certain species of *Rhus* contain a fatty substance, chiefly in the pericarp, which is generally, although erroneously, referred to as "wax." The best known of these species is *R. succedanea*, Linn., the source of the so-called "Japan wax" of commerce. Other species of *Rhus* occurring in China and Japan also contain a fatty or wax-like material in the fruit. (The characters and method of collection of this wax were noted in the *C. & D.*, 1927, I, 704.) In order to obtain the last traces of "wax" from the presses small quantities of perilla oil (*Perilla ocymoides*, Linn.) may be added. This causes the resulting product to be somewhat softer and is said to account for the variation in hardness in commercial samples of Japan wax. This "wax" has been in use in Japan since remote times, being employed chiefly for candle-making and to a lesser degree for polishing purposes.

Wax from Sugar Cane

Saccharum.—In the sugar cane, *Saccharum officinarum*, Linn., a waxy substance occurs freely on the stalks in the form of a white powdery layer. This layer or film varies in thickness on different parts of the stalk and also with different varieties of cane. In some varieties it may be almost absent, in others present to the extent of 0.05 per cent. Wax is very prevalent on the well-known variety known as uba, which is now widely distributed throughout the warmer countries of the world and has played so important a part in the sugar industry of Natal. Where this cane is milled the filter-press cake may contain up to 17 per cent. of crude wax, and 14 per cent. is quite common. There are serious difficulties to be overcome in extracting the wax in a pure state from the press cake, as it occurs there contaminated with fatty and resinous substances. If the wax is removed by mechanical means from the stalks before milling it is then obtained in a fairly pure state. However, no practically successful method for the mechanical separation of the wax from the stalks has yet been devised. The author has been informed by a representative of a large firm of polish manufacturers that attempts at using the wax on a large scale by his firm were not satisfactory, one of their chief objections being the offensive odour which permeated the whole factory while it was being worked. Chemically purified cane wax is a shining, pale yellow product, resembling refined carnauba wax in many respects.

Stipa.—Esparto grass (*Stipa tenacissima*, Linn.) is a raw material obtained from certain Mediterranean countries, chiefly Spain and Northern Africa, which is largely used in the paper-making industry. Wax occurs on the leaves and may be collected as a by-product when the grass is treated for paper manufacture. Esparto grass reaches the paper mills in this country in the form of tightly pressed bales. Before the necessary chemical treatment for paper-making is possible these bales have to be loosened and torn to pieces, a process performed by machinery. During this operation a good deal of dust is liberated, which is drawn off in a strong air current and subsequently collected. This dust was formerly regarded as simply a troublesome waste material, but was later shown to contain from 25 to 50 per cent. of wax, which may be extracted by various means. This wax is now used by polish and other manufacturers in this country, and is known by the trade name of fibre wax. Wax is present to a noticeable degree on numerous other grasses, particularly among tropical species and those occurring in arid regions. A bibliography is appended to the article.

The vitamin B complex.—The text of a monograph presented by Dr. R. A. Peters at the recent annual meeting of the British Medical Association ("British Medical Journal," 3957, 903) begins with the following statement:—

. . . research in many laboratories has shown that at least six entities compose the vitamin B complex, which can be described as follows:

Vitamin B_1 (aneurin or torulin)
Vitamin B_2 { lactoflavin
vitamin B_6 (rat anti-dermatitis)
Vitamin B_3 and B_5 (including the chicken anti-pellagra factor)
Vitamin B_4 (position at present obscure)
Human anti-pellagra, P.P.
Dog black tongue factor
Pigeon heart-block factor
Bios and growth factors for micro-organisms.

Trade Returns 1934-36

The following tables and other information, which has been compiled from the December Trade and Navigation Accounts, provide a comparison of the trade for the years 1934 to 1936. The values of our international trade in all classes of merchandise, exclusive of bullion and specie, for the three years under review were:—

	Imports	U.K. Goods Exported	Re-Exports	Total Exports	Total International Trade	Debit Trade Balance
	£	£	£	£	£	£
1936	848,935,895	440,718,784	60,416,361	501,135,145	1,350,071,040	347,800,750
1935	756,936,175	425,921,343	55,265,376	481,186,719	1,238,122,894	275,749,456
1934	731,016,119	395,985,521	51,243,347	447,228,868	1,178,642,651	284,184,915

Imports

Details of imports of some individual products of interest to the trade are given as follows:—CITRIC ACID: 1936, 23,310 cwt. (£88,590): 1935, 15,261 cwt. (£58,300): 1934, 18,388 cwt. (£52,491). TARTARIC ACID: 1936, 31,846 cwt. (£130,078): 1935, 32,937 cwt. (£138,826): 1934, 41,140 cwt. (£170,975). QUININE AND SALTS: 1936, 1,406,563 oz. (£109,950): 1935, 1,298,458 oz. (£106,779): 1934, 951,217 oz. (£79,513). PROPRIETARY MEDICINES, n.e.s.: 1936, £523,275: 1935, £570,009: 1934, £531,901. BORIC ACID: 1936, 41,524 cwt. (£42,363): 1935, 40,329 cwt. (£39,850): 1934, 41,915 cwt. (£41,003). BORAX: 1936, 177,743 cwt. (£99,288): 1935, 183,336 cwt. (£97,671): 1934, 218,095 cwt. (£114,853). The sources of imports of the group "Chemicals, Drugs, Dyes and Colours" for the past three years were as follows:—

From	1934	1935	1936
	£	£	£
Union of South Africa ...	190,863	228,971	244,529
British India	204,699	197,640	233,900
Canada	585,083	575,658	593,304
Other British Countries ...	237,921	315,510	380,248
Soviet Union	140,795	86,944	60,688
Sweden	137,507	160,217	178,494
Norway	444,100	444,000	385,391
Germany	3,574,800	3,620,788	4,154,413
Netherlands	514,042	421,127	469,963
Java	45,504	32,701	25,102
Belgium	624,262	691,894	561,498
France	716,216	776,814	835,558
Switzerland	620,019	732,235	779,085
Spain	206,877	169,302	171,405
Italy	224,685	237,202	28,705
Jugo-slavia	121,342	121,751	146,029
Japan	82,922	79,825	118,394
United States of America	1,808,973	1,920,287	2,165,813
Chile	78,398	219,835	324,220
Argentine Republic ...	341,905	255,342	307,115
Other Foreign Countries...	235,843	313,441	420,381

Exports

Details of interest as regards exports of "Chemicals etc.," are as follows:—QUININE AND SALTS: 1936, 1,822,821 oz. (£184,181): 1935, 1,790,162 oz. (£190,482): 1934, 1,247,133 oz. (£137,789). PROPRIETARY MEDICINES, n.e.s.: 1936, £1,263,928: 1935, £1,217,932: 1934, £1,150,704. Values and destinations of exports of "Chemicals, etc.," during the past three years were:—

To	1934	1935	1936
	£	£	£
Irish Free State	1,048,865	1,063,738	1,057,980
British West Africa ...	444,360	477,104	557,461
Union of South Africa ...	1,420,145	1,438,679	1,568,945
British India	2,567,092	2,881,814	2,530,962
British Malaya	363,044	377,535	408,967
Ceylon	288,231	304,790	219,871
Hong Kong	195,399	226,490	244,868
Australia	1,554,670	1,770,314	1,855,162
New Zealand	630,494	699,190	731,764
Canada	1,234,531	1,195,872	1,235,750
British West India Islands	271,897	276,232	299,033
Other British Countries ...	1,030,149	1,130,625	1,170,486
Soviet Union	46,774	71,656	77,349
Sweden	385,912	517,314	528,056
Norway	296,133	363,233	384,556
Poland	120,021	115,716	101,603
Germany	278,055	261,003	301,941
Netherlands	505,397	427,057	543,886
Dutch East Indies	138,896	145,766	125,187
Belgium	374,957	305,258	310,687
France	703,349	781,716	869,251
Switzerland	81,970	94,210	86,516
Portuguese East Africa ...	120,041	130,825	116,144
Spain	428,890	338,276	164,720
Canary Islands	139,844	123,862	88,321
Italy	234,337	177,555	8,115
Greece	160,488	216,171	174,218
Egypt	464,040	474,298	468,070
China	444,614	430,732	440,705
Japan	502,139	379,871	309,671
United States of America ...	650,693	700,169	1,024,537
Chile	93,959	110,300	91,427
Brazil	543,139	486,742	398,496
Argentine Republic ...	763,485	737,409	657,303
Other Foreign Countries ...	2,082,685	2,096,981	1,947,082

The returns for the years 1934 to 1936 in the group "Chemicals, Drugs, Dyes and Colours" were as follows:—

	Imports	U.K. Goods Exported		Re-Exports	Total Exports	Credit Trade Balance
		To Empire Countries	To Foreign Countries			
	£	£	£	£	£	£
1936	12,584,235	11,881,249	9,217,841	403,676	21,502,766	8,981,531
1935	11,941,031	11,385,644	9,034,489	578,879	20,999,012	9,057,981
1934	11,289,980	11,540,480	8,016,065	820,228	20,376,773	9,086,793

Trade Report

Where possible scales of prices of chemicals are given for bulk down to small quantities. Prices recorded for crude drugs, essential and fixed oils and coal tar products are for fair sized wholesale quantities. Qualities of chemicals, drugs, essential and fixed oils, etc., vary, and selected brands or grades would be at higher values

28 Essex Street, W.C.2, January 21

BUSINESS IN MOST MARKETS has been better this week, and many products have met with a brisk demand. The general tone is very steady. The number of articles quoted dearer is increasing, and the rise in values to better levels is now becoming general. In the PHARMACEUTICAL CHEMICALS markets business has been on a better scale. The new home trade scale of prices for GLYCERIN, B.P., is now available. Details of the increase in prices for British and Continental CAFFEINE are to hand. VANILLIN is very steady.

Crude Drugs

Business in these commodities continues quite good, and the general tone firm, with a number of further increases in values recorded. Japanese shippers' prices for new crop AGAR are again sharply dearer ; spot supplies scarce and advanced. Japanese CAMPHOR is dearer on spot, following the rise in shipment quotations. Most descriptions of CARDAMOMS are nominal, spot and forward, owing to lack of supplies. CLOVES are quoted dearer. All descriptions of ERGOT are very short on spot at high figures, and there is practically nothing offered forward. GENTIAN is again dearer. There has been a sharp rise in GUM ACACIA, spot and forward. HYDRASTIS is very firm and the source reports shortage with values advancing. Japanese MENTHOL has sold well on spot, while shippers' quotations continue firm at still higher figures. Chinese MENTHOL is quoted for shipment. We give a detailed and authoritative report on the MERCURY market. Following the firmer tone of last week, SENEGA has soared right up and is very firm, with the source particularly strong. BEES' WAXES show a sharp advance ; spot supplies are practically cleared ; shipment dearer and offers restricted. CARNAUBA WAXES have advanced.

Essential Oils

Business in a wide range of products has been active and values have been constantly moving up. Shortage of spot supplies, with no shipment offers, is a feature in many instances. Isolated shipment offers of ANISE (STAR) at high figures ; spot continues firm. BAY tends firmer. The limited supplies of BOIS DE ROSE are firm and again dearer ; no shipment offers. Dutch CARAWAY tends dearer. CASSIA is an improved market. Ceylon CINNAMON LEAF is again dearer and very firm forward. Shipment prices for Ceylon CITRONELLA have been rushed up to a very high level. British and Madagascar CLOVE are dearer. Californian GRAPE-FRUIT is a better market. HO (SHIU) is firm and again dearer on spot ; no forward offers. LAVANDIN is sharply dearer. Shipment quotations for Sicilian hand-pressed LEMON continue upwards, and spot holders are reserved at an advance. Californian distilled LEMON is dearer but available supplies are all sold. LEMONGRASS is dearer forward again this week. MANDARIN shows an advance. French Guinea ORANGE is quoted for shipment at a further advance ; spot supplies scarce and dearer. PALMAROSA is practically nominal on spot, due to lack of supplies. Singapore PATCHOULI is quoted dearer, spot and forward. Japanese PEPPERMINT has sold well on spot, and market business in the forward position has been substantial. Japanese shippers' prices are dearer and very firm. Spanish ROSEMARY and SPIKE are in short supply on spot. SAFROL is again dearer.

A drug auction will be held at the Commercial Sale Rooms, Mincing Lane, London, E.C.3, on Thursday next, January 28.

Exchange Rates on London

THE following is a list of the chief Continental and other exchange rates at the opening on Thursday morning:—

Centre	Quoted	Par	Jan. 14	Jan. 21
Amsterdam	Fls. to £	12·107	8·97	8·96
Berlin	Mks. to £	20·43	12·20	12·20
Brussels	Belgas to £	nominal	29·11	29·12
Copenhagen	Kr. to £	18·159	22·40	22·40
Lisbon	Esc. to £	110	109⅜	109⅜
Madrid	Ptas. to £	25·22½	nominal	nominal
Milan	Lire to £	92·46	93¼	93¼
Montreal	Dol. to £	4·86⅜	4·91⅛	4·91⅛
New York	Dol. to £	nominal	4·91¼	4·90⅜
Oslo	Kr. to £	18·159	18·90	19·90
Paris	Fr. to £	124·21	105⅛	105⅛
Prague	Kr. to £	164·25	140⅜	140⅛
Stockholm	Kr. to £	18·150	19·40	19·40
Warsaw	Zloty to £	43·38	26	26
Zurich	Fr. to £	25·2115	21·38½	21·38¼

Bank rate 2 per cent.

Pharmaceutical Chemicals, etc.

A RATHER better demand is recorded this week, with the general tone steady. Glycerin, B.P., continues scarce and firm at the recent advances. British and Continental caffeine prices for this market are now available in detail.

ACETIC ACID (B.P., 99 to 100 per cent. glacial).—One cwt., carboy, 56s.; 28 lb., 10d.; 7 lb., 1s. per lb.

AMIDOPYRINE.—Dealers' prices keen, business quiet: crystals, five cwt., 17s. 7½d.; two cwt., 18s. 0¾d.; one cwt., 18s. 5¼d.; less than one cwt., 18s. 10½d. per lb., with powder 2½d. per lb. extra.

ACETONE (B.G.S.).—Six winchesters, 10d.; 7 lb., 11d. per lb.

AMMONIUM ICHTHIOSULPHONATE.—Market steady, fair business in small lots: one cwt., 1s. 6½d., in 14-lb. tins ; 1s. 8d., in 1-lb. tins ; 1s. 10½d., in 8-oz. tins, and 2s. 1d. per lb. in 4-oz. tins.

ASPIRIN.—Makers' and dealers' prices are unchanged, business continues on a very fair scale: home trade, ten cwt., 2s. 7d.; five cwt., 2s. 8d.; one cwt., 2s. 8½d.; 28 lb., 2s. 9d.; 14 lb., 2s. 10d.; 7 lb., 3s.; 4 lb., 3s. 2d.; 1 lb., 3s. 4d. per lb. Bulk packing free, net, carriage paid. Contracts, over twelve months, minimum one ton ; over six months, less than one ton.

BISMUTH SALTS.—Makers' scales of prices and terms of payment continue at the recent revision: Carbonate, not less than one cwt., 6s. 6d.; 28 lb., 6s. 9d.; 8 lb., 7s. 3d.; 4 lb., 8s.; less than 4 lb., 8s. 6d. per lb.

BORIC ACID (B.P.).—Crystals, one cwt., 45s.; 7 lb., 5½d.; powder, one cwt., 47s.; 7 lb., 6d. per lb.

BROMIDES.—Makers' scales of prices steady. No Continental quotations. POTASSIUM, B.P., five cwt., 1s. 8d.; one cwt., 1s. 9d.; 28 lb., 2s. per lb. SODIUM, B.P., five cwt., 1s. 10d.; one cwt., 1s. 11d.; 28 lb., 2s. 2d. per lb. AMMONIUM, B.P., five cwt., 1s. 11d.; one cwt., 2s.; 28 lb., 2s. 3d. per lb., net. Resale clause applies. 28-lb. parcels and one-cwt. cases free. Export quotations are maintained, as follows: POTASSIUM, B.P., five cwt., 1s. 4d.; one cwt., 1s. 4½d. SODIUM, B.P., five cwt., 1s. 5d.; one cwt., 1s. 5½d. AMMONIUM, B.P., five cwt., 1s. 6½d.; one cwt., 1s. 7d. per lb., f.o.b.

BUTYL CHLORAL HYDRATE.—Quiet demand: spot, 14 lb., 8s.; 7 lb., 8s. 3d.; 1 lb., 8s. 6d. per lb., in 1-lb. bottles.

CAFFEINE.—The new scales for Continental material, duty paid, in 5-lb. tins, are as follows:—Pure, alkaloid, two cwt., 8s. 10½d.; one cwt., 9s. 0¼d.; 56 lb., 9s. 2¼d.; less than 56 lb., 9s. 4¼d. per lb. Citrate, two cwt., 5s. 11¾d.; one cwt., 6s. 0¾d.; 56 lb., 6s. 1¾d.; less than 56 lb., 6s. 2¾d. per lb. Soda. Sal., two cwt., 6s. 2¾d.; one cwt., 6s. 3¾d.; 56 lb., 6s. 4¾d.; less than 56 lb., 6s. 5¾d. per lb. English makers have revised their prices, as follows: Pure alkaloid, two cwt., 9s.; one cwt., 9s. 2d.; 56 lb., 9s. 4d.; less than 56 lb., 9s. 6d. per lb. Citrate, two cwt., 5s. 11d.; one cwt., 6s.; 56 lb., 6s. 1d.; less than 56 lb., 6s. 2d. per lb.

CITRIC ACID (B.P. CRYSTALS).—Market continues steady: British material quoted at 1s. per lb., less 5 per cent. discount, nominal and without engagement. Dealers' prices for imported material are competitive.

CREAM OF TARTAR.—Fair business at recent values: British material, 99 to 100 per cent., 79s. per cwt., less 2½ per cent. discount. Dealers' prices for foreign material competitive.

MERCURIALS.—Makers' scales of prices continue firm: not less than one cwt., ammoniated, B.P., lump, 5s. 5d.; powder, 5s. 7d.; bichloride, B.P., lump, 4s. 8d.; powder, 4s. 4d.; chloride, B.P., 5s. 5d.; yellow oxide, B.P., 5s. 10d.; persulphate, white, B.P.C., 5s. 7d.; sulphide, black (hyd. sulph. cum sulph., 50 per cent.), 5s. 6d.; less than one cwt., ammoniated, B.P., lump, 5s. 6d.; powder, 5s. 8d.; bichloride, B.P., lump, 4s. 9d.; powder, 4s. 5d.; chloride, B.P., 5s. 6d.; yellow oxide, B.P., 5s. 11d.; persulphate, white, B.P.C., 5s. 8d.; sulphide, black (hyd. sulph. cum sulph., 50 per cent.), 5s. 7d. per lb. Special prices for large quantities.

METHYL SALICYLATE.—Seasonal demand is still noted, makers' prices steady: spot, ten cwt., 1s. 1¾d.; five cwt., 1s. 2d.; one cwt., 1s. 2¼d.; less than one cwt., 1s. 2½d.; small quantities, in bottles, up to 2s. per lb.

METHYL SULPHONAL.—Business on spot is slow, quotations keen: two cwt., 19s. 3¾d.; one cwt., 19s. 9¼d.; 56 lb., 20s. 2¾d.; small parcels, up to 20s. 9d. per lb.

PHENACETIN.—Steady business, with prices unchanged: crystals or powder, bulk quantities, 2s. 6d.; smaller parcels, 2s. 7d. to 2s. 9d. per lb., as to quantity.

GLYCERIN (B.P.).—As announced last week, the scale of prices for home trade has been advanced a further £15 per ton, as follows:—

Contracts or single deliveries of	Under 1 cwt.	1 cwt. and under 2½ cwt.	2½ cwt. and under 5 cwt.	5 cwt. and under 10 cwt.	10 cwt. and under 20 cwt.	1 ton and under 5 tons
Minimum deliveries off contracts of	—	1 cwt.	1 cwt.	1 cwt.	2 cwt.	5 cwt.
In glass packages	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1 lb. bottles ... ... per lb.	1 4	—	—	—	—	—
1 winchester ... ... ,,	1 3	—	—	—	—	—
3 winchesters ... ... ,,	1 2	—	—	—	—	—
6 winchesters ... ... ,,	1 1½	—	—	—	—	—
12 winchesters ... ... ,,	1 1	—	—	—	—	—
Net, bottles extra.						
Tins 14 lb. each ...per cwt.	117 6	113 0	112 0	109 0	108 0	104 0
Tins 28 lb. ,, ... ,,	114 6	110 6	109 6	106 6	105 6	101 6
Tins 56 lb. ,, ... ,,	111 6	108 0	107 0	104 0	103 0	99 0
Drums 1 cwt. (charged 20s.) ,,	—	103 6	102 6	99 6	98 6	94 6
Drums 2½ cwt. (,, 60s.) ,,	—	—	100 6	97 6	96 6	92 6
Drums 5 cwt. (,, 75s.) ,,	—	—	—	97·0	96 0	92 0
Drums 10 cwt. (,, 100s.) ,,	—	—	—	—	95 6	91 6

Tins and cases free, glass packages and iron drums charged extra and returnable. Drums credited in full only if returned carriage forward in good condition within six months of date of invoice. Contracts booked for delivery over 12 months. 2½ per cent. monthly account except where stated net. 14 lb. and over carriage paid direct ex works, smaller quantities carriage paid if forming part of a carriage paid order. Any style and size of package may be assorted to secure relative quantity price. Prices are quoted subject to an undertaking on the part of the buyer not to resell at prices and terms below the scale for such quantities current at the time the resale is made.

PHENAZONE.—Cheap offers, with the spot demand quiet. Dealers are offering supplies in the region of 6s. to 6s. 6d. per lb., as to quantity.

PHENOLPHTHALEIN.—A rather quiet market, with quotations mostly maintained: two cwt., 2s. 9d.; one cwt., 2s. 10d.; 28 lb., 3s.; 14 lb., 3s. 1d.; 7 lb., 3s. 2d.; smaller parcels, up to 3s. 6d. per lb.

PHENYLETHYLBARBITURIC ACID.—Average amount of small business being done: spot, 24s. 6d. to 25s. per lb., in 2-lb. bottles.

QUININE SALTS.—Convention prices continue nominally unchanged. Quoted in sterling only: sulphate, 2s. 2d.; bisulphate, 2s. 2d.; ethyl carbonate, 2s. 9¾d.; salicylate, 2s. 10½d.; hydrochloride, 2s. 8¼d.; bihydrochloride, 3s.; hydrobromide, 2s. 8½d.; bihydrobromide, 3s.; valerianate, 3s. 8d.; hypophosphite, 4s.; alkaloids, 3s. 0½d. per oz., carriage paid on bulk quantities; 100-oz. tins free, smaller packages extra.

SANTONIN.—The demand is still quiet with prices favouring buyers: spot, £12 to £12 10s. per kilo, as to quantity.

SODIUM BENZOATE (B.P.).—Steady business at competitive prices: bulk quantities, 1s. 6d.; one cwt., 1s. 7d.; smaller parcels, 1s. 8d. to 2s. per lb., as to quantity.

SODIUM DIETHYLBARBITURATE.—A quite demand: spot, one cwt., 12s. 3d.; 28 lb., 12s. 6d.; 14 lb., 12s. 9d.; 7 lb., 13s.; smaller parcels, up to 13s. 6d. per lb.

SODIUM SALICYLATE (B.P.).—Business about average, makers' prices steady: home trade, crystals or powder, five cwt., 1s. 5½d.; one cwt., 1s. 6d.; 28 lb., 1s. 9d.; 14 lb., 1s. 10d.; 7 lb., 2s.; 1 lb., 2s. 3d. per lb.

SUGAR OF MILK.—British makers' prices for home trade continue at the advance recorded last week: one ton, 69s.; ten cwt., 69s. 6d.; two cwt., 70s. 6d. per cwt. Foreign material also recently quoted dearer.

SULPHONAL.—The spot market is very keen, with business poor: crystals or powder, two cwt., 15s. 3¾d. one cwt., 15s. 10¾d.; 56 lb., 16s. 1d.; smaller parcels, up to 16s. 7½d. per lb.

SULPHURIC ACID (B.P.).—One carboy, 32s. 6d.; 28 lb., 5d. per lb. Redistilled, one penny per lb. extra.

TARTARIC ACID (B.P. CRYSTALS).—Continues steady at the recent slight reduction: British makers quote at 11¼d. per lb., less than 5 per cent. discount. Dealers offering foreign materials at competitive prices.

Crude Drugs, etc.

ACONITE ROOT.—Spot supplies of Japanese in small parcels are available at about 48s. 6d. to 50s. per cwt., ex store.

AGAR.—The Japanese shipment market is again sharply dearer and very firm. Shippers are only offering February-March, with Kobe No. 1, 2s. 10d.; considerable business reported by re-sellers of February-March at 2s. 6½d. Shippers quote No. 2 Kobe at 2s. 7½d. and Yokohama No. 1, 2s. 7d. per lb., c.i.f. Very small stocks on spot, firmly held: spot, Kobe No 1, 3s. 3d.; No. 2, 2s. 10½d.; Yokohama No. 1, 2s. 10d. per lb.

ALOES.—Market continues fully steady, with not much important business moving: Cape, spot, 60s. to 62s. 6d., as to quality; shipment, prime, 57s. 6d. per cwt., c.i.f. Curaçao, spot, 95s. to 115s., as to quality; shipment, 90s. to 92s. 6d. per cwt., c.i.f.

ANTIMONY.—Chinese crude, spot, £35; shipment February-March, £32 10s., c.i.f. English regulus, £75 to £76 per ton, spot.

ARNICA FLOWERS.—The spot market tends rather dearer, with holders now quoting 1s. 2d. to 1s. 3d. per lb., ex store, as to quantity.

BALSAMS.—The chief demand this week has been for *Copaiba*, which tends firmer. Other descriptions steady: *Tolu*, 1s. 9d.; *Canada*, 2s. 7d.; *Copaiba*, 1s. 3d.; *Peru*, 5s. 3d. per lb., spot.

BARBASCO ROOT.—Occasional inquiry, with spot root, testing 7.2 rotenone, available at about 1s. 1d. per lb., ex store.

BELLADONNA.—Dealers' quotations for spot supplies are dearer: leaves, 57s. 6d.; root, 48s. 6d. per cwt., in small parcels.

BENZOIN.—Only a modest sale, with remarkably cheap prices quoted. Good seconds, 90s. to 100s.; thirds, 80s. per cwt., ex store.

BUCHU.—The market tends irregular. The spot values for rounds mentioned range about 2s. 2d. to 2s. 4d. per lb., as to quality. Ovals, about 1s. 11d. per lb., ex store. The few shipment quotations received vary, with the lowest recorded being 1s. 6d., c.i.f., ranging up to 1s. 10d. per lb., c.i.f. Business reported at the lower value.

CAMPHOR.—The demand on spot has been very fair and prices have been advanced to conform to the rise in shipment recorded last week: Japanese, spot, tablets 2s. 6d.; powder, 2s. 3d.; slabs, 2s. 2¾d. per lb., ex store; shipment, tablets, 2s. 3d.; powder, 2s. 1d.; slabs, 2s. 0½d. per lb., c.i.f. English refined flowers: one cwt., 3s. 1d.; 28 lb., 3s. 2d.; small lots, 3s. 3d. per lb. Transparent, tablets, 4 oz., 8 oz. and 16 oz., 3s. 4d.; 1 oz. and 2 oz., 3s. 5d., ⅛ oz. and ¼ oz., 3s. 6d. per lb. Contracts at special prices.

CANTHARIDES.—Small business moving at former figures: spot, Russian, 6s. to 6s. 3d.; Chinese, 1s. 10½d. to 2s. per lb., as to quantity; shipment, 1s. 8d. per lb., c.i.f.

CARDAMOMS.—The restricted shipment offers of Aleppy greens are again dearer at 4s. 3d., c.i.f. No offers of Bombay seed. Mangalore 5s. 9d., c.i.f., reported paid: spot, if available, Mangalore, 6s. 3d. per lb. No offers, spot or forward, of other descriptions. Market generally very firm.

CASCARA SAGRADA.—Values are keeping fully steady, while the demand remains modest: spot, 1933 peel, 65s.; 1936 peel, 56s. 6d. per cwt.; shipment, 1934 peel, 56s.; 1936 peel, 52s. per cwt., c.i.f.

CHAMOMILES.—Steady sales in small lots on spot, with values ranging from about 125s. to 100s. per cwt. for off-colour flowers.

CLOVES.—At the further advances the market is fully steady, business better: Zanzibar, spot, 8¾d.; shipment, January-February, 8½d. per lb., c.i.f.; Madagascar, in bond, 8½d.; shipment, January-February, 8⅝d. per lb., c.i.f.

The landings of Zanzibar in London during the week ended January 16 were 120, and the deliveries *nil*, leaving a stock of 1,719. From January 1 to date the landings of Zanzibar have been 145 and the deliveries 102. Landings of Madagascar for the week ended January 16 were *nil*, and the deliveries 23, leaving a stock of 1,888. From January 1 to date the landings of Madagascar have been 761 and the deliveries 106 packages.

COCOA BUTTER.—The market continues to advance and is firm: prime English, 1s. 6d. to 1s. 6½d. per lb. Foreign, 1s. 4d. to 1s. 5d. per lb., as to quantity.

COCONUT (DESICCATED).—Market has been quieter but values are about maintained at recent advances: spot, fine, 34s.; medium, 32s. per cwt.; shipment, halves, January-March, 32s. 9d.; April, 32s. 6d. per cwt., c.i.f.

COD-LIVER OIL.—Bergen reports the shipment market fully steady at last week's advance, business quieter: finest Lofoten steam refined, non-freezing, medicinal oil, 98s. to 100s. per barrel, c.i.f. London. Spot, in small lots, about 128s. per barrel, ex store. Newfoundland, non-freezing medicinal oil, 130s. per barrel, ex store. British non-freezing medicinal oil is now quoted at 92s. to 100s. per barrel, c.i.f. London. duty free, while quotations from another home source are at higher figures.

COLCHICUM.—A small demand for spot supplies of root, quoted at about 42s. 6d. per cwt., ex store.

DAMIANA LEAVES.—Dealers are doing average spot business in small parcels at about 8½d. per lb., ex store.

DANDELION ROOT.—Some spot supplies of foreign clean root are offering at about 77s. 6d. to 80s. per cwt., as to quantity.

DERRIS ROOT.—There has been a moderate inquiry for shipment, with the price for 17 per cent. ether extract steady at about 8¼d. to 8¾d. per lb., c.i.f. Some supplies of spot root are available at about 11d. to 1s. 1d. per lb., as to test.

ERGOT.—Due to lack of supplies on spot and the very few forward offers, business has been restricted, and it is difficult to define values. The market is certainly firm. A little lot of Russian is firmly held on spot for 5s. 9d., and any Spanish/Portuguese would be at least 6s. 3d. Bids cabled to Portugal at 5s. 7½d., c.i.f., refused and not countered. No shipment offers of Spanish or Russian.

GENTIAN.—Shipment offers, which are few in number, for French are dearer at 55s., c.i.f. The spot market is firm and at an advance with mid-Continental root from 54s. and French from 58s. per cwt., ex store, tending dearer.

GINGER.—Quoted values are maintained, market rather quiet: West African, spot, 62s.; shipment, January-March, 50s. per cwt.,

c.i.f.; Jamaican, spot, bold, in barrels, 87s. 6d. to 90s.; small grinding, 62s. 6d. per cwt., in bags, ex store.

GUM ACACIA.—The market is firm and quoted sharply dearer forward for new crop: spot, Kordofan cleaned sorts, 48s. 6d.; bleached, No. 1, 105s.; extra, 117s. 6d. per cwt.; shipment, Kordofan cleaned sorts, 47s. 6d. per cwt., c.i.f.

HENNA.—Supplies of Egyptian leaves are offering on spot from 25s. to 32s. 6d. per cwt., ex store, as to quality.

HONEY.—Business has again been unimportant; market steady as quoted: Jamaican, 40s. to 50s. for dark manufacturing to pale set. Californian, white clover, 52s. 6d., duty paid. Canadian, white clover, 50s., ex store. Mexican firm at 39s. 6d. duty paid.

HYDRASTIS.—Conditions in this market are very firm and the source reports shortage with higher prices confidently forecasted: spot, 13s.; shipment, 12s. 9d. per lb., c.i.f., which may be withdrawn.

IPECACUANHA.—Market continues firm but there has not been much business moving: Matto Grosso, B.P. test, 7s. to 7s. 3d. per lb.; shipment, nominal, with the source reporting no likelihood of supplies for some time.

KOLA NUTS.—Some Jamaican available at 3¼d. and St. Lucia at 4d. per lb. African halves are quoted steadily at 3½d. per lb., ex store.

LIQUORICE ROOT.—The call for natural root is slow, with spot quoted at about 12s. 6d. per cwt., ex store.

LOBELIA HERB.—Supplies are freely available here, with the price round about 7½d.; shipment, about 7d. per lb., c.i.f.

LYCOPODIUM.—A few small sales recorded, with spot quoted at about 4s. per lb. for small parcels.

MANNA.—Supplies of finest selected flake, in 1-lb. tins, quoted on spot at about 4s. per lb.

MENTHOL.—There has been a fairly substantial spot business with K/S brands comparatively cheap at 12s. 6d. to 12s. 9d. per lb. Afloat parcels, 11s. 3d. paid and 11s. 6d., c.i.f., now wanted. Japanese shippers are firm with January-March at 12s. 6d., c.i.f., with near bids refused Substantial business by re-sellers of January-March at 11s. 9d. per lb., c.i.f. CHINESE, B.P., is quoted on spot at 12s. 4½d., and finds a steady sale. New crop, January-February shipment, 12s. 3d. per lb., c.i.f. English synthetic is quoted unchanged from 7s. 6d. to 10s. 6d. per lb., as to quality and quantity.

MERCURY.—We are authorised to deny the reports that have recently appeared in the daily and trade press to the effect that (1) the concession for world sales of the metal from the Almaden mines had been negotiated to French interests, and (2) that the concession had been granted to new distributors in this country. We are advised that the London House who formerly held the world sales of Spanish/Italian metal have just concluded a new agreement to act in the same capacity for the world sale of mercury from the Spanish Almaden mines. The market is very firm and quoted dearer with available supplies at the source at a very low level. Shipment, f.o.b. Continent, 69 dollars, 50 cents per lb.; c.i.f. London, £14 3s. 6d. Limited spot stocks are quoted at £14 6s. per bottle, ex store, London. With regard to the Italian metal, formerly controlled by the Cartel, we are advised that agreement has been concluded providing for world distribution to be carried on in London by a new company, which will be controlled by the London firm who have been responsible for mercury sales in the past.

OPIUM.—Average small spot business, values steady: spot, Turkish, 1s. 3d. per unit, landed and duty paid. Persian, 1s. per unit, in bond.

ORANGE PEEL.—Quarters are offered for March shipment at about 50s. per cwt., c.i.f. On spot, thin cut is quoted from 11d. to 1s. 3d. per lb., as to quality, ex store.

PEPPER.—Values are slightly easier on the week, business quieter: Lampong, in bond, 3⅜d.; shipment, January-March, 3s.; March-May, 3 1/16d.; April-June, 3¼d., c.i.f. Tellicherry, spot, 4⅝d.; shipment, January-March, 4½s., c.i.f. Aleppy, spot, 4⅜d.; shipment, January-March, 4½s., c.i.f. White Muntok, in bond, 6d.; shipment, January-March, 5⅛d.; March-May, 5⅜d. per lb., c.i.f.

PIMENTO.—Market has been quieter, values maintained: spot, 8½d. per lb.; shipment, January-March, 75s. per cwt., c.i.f.

QUILLAIA BARK.—Small sales on spot with whole bark at 25s. and crushed bark at 32s. 6d. per cwt., ex store.

RHUBARB.—Market is steady with chief interest in Rough Round: spot, Shensi, 3s. 9d. to 4s.; pickings, 2s. 3d. to 2s. 6d. Rough round, all pinky, dearer at 1s. 8d., and ordinary quality now at 1s. 6½d. per lb., ex store. Practically no shipment offers.

RUBBER.—Values are easier on the week and business has been less active, closing steady: standard ribbed smoked sheet, spot, 10 1/16d.; January, 10 3/16d.; February, 10 3/16d.; March, 10 3/16d.; April-June, 10 5/16d.; July-September, 10⅛d.; October-December, 10 1/16d. per lb.

SARSAPARILLA.—Fair business in moderate quantities, values steady: spot, Jamaican grey, 1s. 2d. to 1s. 3d.; native, mixed colours, 10d. to 1s. per lb., as to quantity, spot.

SEEDS.—ANISE.—Bulgarian, 31s. spot, duty paid. CARAWAY.—Dutch spot, 35s. 6d., duty paid; 31s. quoted f.o.b. Holland. CANARY.—Spot: Mazagan, 29s.; Turkish, 24s.; Plate, 25s.; and Spanish, 50s.; all duty paid. CORIANDER.—Owing to the reports from Morocco stating that there is very little more to be sold, the market has advanced to 15s., c.i.f., for prompt shipment; on spot, 16s. 6d. duty paid is now quoted. CUMIN.—No Malta offering; Morocco is quoted at 30s., duty paid. FENUGREEK.—Morocco, on spot, 14s. to 14s. 6d., duty paid. MUSTARD.—English, 21s. to 32s. per cwt., according to quality.

SENEGA.—Following the indication of an advancing market reported last week, values have risen sharply with spot not less than 2s. with sellers reserved. Considerable business done on the market, but not much of it by consumers. The source reports acute shortage; no firm offers being made at the moment, but a price of 54 cents (2s. 2½d.) per lb., c.i.f., has been indicated.

SENNA.—Inquiry for Tinnevelly continues fair with spot quotations for good green leaves as follows: No. 1 at 5¾d.; No. 2 at 3¾d.; No. 3 at 2¾d. per lb. Hand-picked Tinnevelly pods: Palish green to dark quality offered at 5½d. to 3¾d. per lb. Alexandrian: no arrivals of best quality hand-picked new crop pods have yet reached this market, and only ordinary to medium old crop qualities are available at 1s. 3d. to 2s. 6d. per lb. Fair quality manufacturing pods offer at 4d. per lb., ex wharf London

SHELLAC.—Values are about level on the week, market steady: spot, standard TN orange, 56s. to 61s.; fine orange, 65s. to 125s.; pure button, 62s. 6d. to 65s. per cwt., spot. For delivery, TN, March, 56s. 6d.; May, 58s.; August, 59s. 6d. For arrival, February-March, 55s. per cwt., c.i.f.

SLIPPERY ELM BARK.—Limited supplies of grinding quality available on spot at about 7½d. per lb. No wired bundles or slabs offering.

SQUILL.—Dealers are quoting some good white at about 30s. per cwt., ex store.

STRAMONIUM.—Limited demand with good green leaves quoted at 35s. to 40s. per cwt., ex store.

TONKA BEANS.—Market has been quiet, but is steady: fair frosted Para beans, 3s. 4d. to 3s. 6d.; Angostura, 8s. to 8s. 3d. per lb.

TRAGACANTH.—The scarcity of druggists' fine white ribbon continues acute and No. 1 grade has now reached £72 per cwt. Seconds are nominal at £65. A steady inquiry for manufacturing grades, which are now quoted in the region £10 10s. per cwt., ex store. Arrivals continue small.

VALERIAN ROOT.—Market remains quiet: small spot parcels, about 35s. per cwt., ex store.

WAX.—BEES'.—Spot supplies are very scarce and sharply dearer. Shipment offers are also dearer and restricted. Good inquiry on the market. Calcutta, bleached, spot, 145s.; shipment, January-February, 155s., c.i.f. Abyssinian, spot, none offering; shipment, January-February, 127s. 6d. Benguella, in bond, 130s.; shipment, 127s. 6d., c.i.f. Conakry, spot, none offering; shipment, none offering. Dar-es-Salaam, spot, 142s. 6d.; shipment, 140s. per cwt., c.i.f. CARNAUBA.—Market firm and dearer; shipment offers restricted and advancing. Fatty grey, spot, 172s. 6d.; shipment, January-February, 170s., c.i.f. Chalky grey, spot, 167s. 6d.; shipment, January-February, 165s., c.i.f. Primeira, spot, good quality, 220s.; f.a.q., 215s.; afloat, 215s.; shipment, January-February, 210s., c.i.f. Mediana, spot, 210s.; shipment, 205s., c.i.f.

Essential Oils, etc.

BUSINESS has been quite brisk in the majority of products, the demand being for spot goods. The tone is firm with prices still advancing. Some of the strong items are Anise (Star), Brazilian Bois de Rose, Cassia, Cinnamon Leaf, Citronellas, Madagascar Clove, Lavandin, Sicilian Lemon, Lemongrass, French Guinea Orange, Palmarosa, Singapore Patchouli, Peppermint, Safrol and Wormseed.

ALMOND.—Market is steadier and rather more business in small quantities reported: English-made, cwt. lots, 3s. 5d.; smaller parcels, 3s. 7d. per lb.; foreign, cwt. lots, 3s.; smaller parcels, 3s. 3d. per lb. English-made oil is firm.

ANISE (STAR).—The spot market continues firm with the limited supplies in strong hands. It is reported that some drums have been booked for shipment at 3s. 1d., c.i.f. Re-sellers of tins, January shipment, 3s. 1½d., c.i.f.; spot, leads, 3s. 7½d.; tins, fully 3s. 6d.; drums, if available, 3s. 4½d. per lb., ex store; shipment, nominal.

BAY.—Quite a good spot demand in small quantities; there is a tendency for prices to advance: 49 to 50 per cent., 4s. 9d. to 4s. 10d.; 59 to 60 per cent., 5s. to 5s. 1½d. per lb., as to quantity.

BERGAMOT.—The general tone continues firm, although business in most quarters on spot remains quiet with quotations about 12s. 6d. to 13s. per lb., as to brand and quantity. In the shipment market shippers report they are not able to purchase from the Consortium, but it is understood that the Consortium have sold direct, through at least one channel, to this market and that fairly good business was done, with nothing more offered at the moment. It is apparent that the position is not giving entire satisfaction.

BOIS DE ROSE.—Continues very firm and the very limited spot stocks of Brazilian oil now available on spot are held for at least 6s. 4½d. and upwards per lb., according to seller. There are no shipment offers. Spot values certainly tend dearer here.

CAJUPUT.—A small normal spot business with values steady: B.P., 1s. 10d. to 2s. 3d. per lb. as to quantity.

CANANGA.—This is one of few oils that remains dull and rather easy: spot, about 6s. 3d. to 6s. 6d.; shipment, not more than 6s. 6d. per lb., c.i.f. Market slack.

CARAWAY.—Holland advises higher prices for the herb and anticipates an advance in oil: at the moment spot is unchanged. Dutch rectified, 7s. to 7s. 3d.; crude, 6s. 8d. to 6s. 10d. per lb., landed and duty paid, as to quantity.

CASSIA.—Conditions in this market are firmer and a little more interest has been shown: shipment, drums, 2s. 7½d.; leads, 2s. 8⅝d., c.i.f.; spot, good quality oil, about 3s. 2d. per lb., ex store, with inferior oil at cheaper rates.

CEDAR LEAF.—Dealers are doing occasional small parcel business with prices about steady at 4s. 9d. to 5s. per lb., as to quantity.

CEDARWOOD.—A very fair inquiry with the basic price for bulk quantities keen: African, in drums, 1s.; smaller packages, up to 1s. 3d. per lb.; American, in drums, 1s. 1d. to 1s. 1½d.; smaller packages, 1s. 4½d. per lb.

CINNAMON LEAF.—A further advance in the shipment price for Ceylon oil is reported, which is now firm and in restricted offering at 3s. 3½d., c.i.f. Spot holders' prices have also advanced, with drums firm at 3s. 7d. and smaller packings up to 3s. 9d. per lb. Genuine Ceylon bark oil, 7s. per oz. Seychelles, 2s. 3d. to 2s. 6d. per oz. A blended oil offered from 16s. per lb.

CITRONELLA.—The shipment market for Ceylon oil has been squeezed up to a level with Java. Spot available at less. While there is no change in shipment quotations for Java the position tends to ease a little. It seems unlikely that either oil will hold their present forward values: Ceylon, spot, drums, 1s. 10d. to 2s.; smaller parcels, up to 2s. 3d.; shipment, drums, 2s. 2d. per lb., c.i.f. Java, spot, drums, 2s. 2d. to 2s. 3d.; smaller parcels, up to 2s. 6d.; shipment, drums, 2s. per lb., c.i.f.

CLOVE.—Shipment offers of Madagascar are now very restricted and are again dearer. The spot market is firm with fair business moving: British makers' price for distilled oil has been advanced to 5s. 6d. per lb., in cwt. lots. Madagascar, spot, drums, 4s. 1½d. to 4s. 3d.; smaller packings, up to 4s. 6d. per lb.; shipment, if available, 3s. 7½d. per lb., c.i.f.

CORIANDER.—Shortage of supplies continues acute. On spot it is reported there is a seller at the moment at about 45s. per lb.; in other quarters the idea of value is about 50s.

EUCALYPTUS.—Shipment prices for Australian continue very firm at last week's advances and restricted to February-March dispatch. Spanish oil available. Australian, 70 to 75 per cent., 1s. 7½d., in tins, and 1s. 7d., in drums; 80 to 85 per cent., 1s. 8¼d., in drums, per lb., landed; higher prices for small lots on spot; shipment, February-March, 70 to 75 per cent., 1s. 5d.; 80 to 85 per cent., 1s. 6d. per lb., c.i.f.; Spanish, 70 to 75 per cent., 1s. 7¼d., landed.

GERANIUM.—Business has been none too good and both spot and the shipment markets continue rather irregular on quotation, according to source of oil: Bourbon, spot, 16s. 9d. to 18s. 6d.; shipment, about 16s. 9d., c.i.f.; Algerian, spot, 16s. to 16s. 9d.; shipment, about 15s. per lb., c.i.f.

GRAPE-FRUIT.—Higher prices are now being asked for supplies of Californian on spot, ranging from about 11s. 3d. to 12s. 6d. per lb., as to quantity. Market steadier.

HO (SHIU).—The shipment market seems to have completely dried up. The spot market continues very firm, particularly for the best grade of oil. Prices vary as to holder, but no offers noted under 2s. up to 2s. 6d. per lb., as to quality and quantity.

JUNIPER BERRY.—A little better inquiry being received with spot values keeping steady at about 3s. to 3s. 3d. per lb., as to quantity.

LAVENDER.—The recent better tone in this market is being well maintained and Lavandin is again dearer, with substantial sales to the East reported: spot prices vary as to quality: spot, 38 to 40 per cent., 15s. 6d. to 18s. 6d. per lb., as to source and quantity. Lavandin is dearer and now at about 9s. 9d. to 10s. 6d. per lb., as to quality and quantity.

LEMON.—Quotations to hand direct from the source this week indicate values are still rising and have ranged from 14s. 4½d. to 15s. per lb., c.i.f., for Sicilian hand-pressed oil, and some quotations, received via Paris, have been as much as 17s., c.i.f. Under these conditions spot holders are reserved in their offerings and their prices are moving up. At the moment they range from 12s. 6d. to 14s., as to brand and seller. No Californian cold-pressed available; the distilled, regular quality oil has been advanced to 8s. 4d. per lb., in drums, landed, with the small supply sold.

LEMONGRASS.—Shipment offers are again dearer with more business being done; the latest quotations have been about 2s. 2d. per lb., c.i.f., February shipment. Spot is firm and in strong hands at 2s. 4½d. per lb., ex store.

MANDARIN.—Spot holders of good quality new crop oil are asking higher prices in the region of 17s. 6d. to 18s. per lb.; this movement is supported by firmer shipment conditions. Some oil on spot may be at cheaper prices.

NUTMEG.—Moderate business in limited quantities is reported with American oil keeping steady at about 5s. 3d. to 5s. 6d. per lb., as to quantity, ex store.

LIME.—Dealers' spot prices for genuine West Indian distilled oil are steady from 22s. 6d. to 23s. 6d. per lb., as to quantity, ex store.

ORANGE.—No interest in Sicilian sweet oil. Inquiry for French Guinea new crop oil continues. Business is reported to have been done at about 4s., c.i.f., February-March shipment, with offers now up to 4s. 3d., c.i.f. On spot the comparatively small supplies are being firmly held with any drums available fully 4s. 6d. and repacked in tins, up to 4s. 10½d. One little lot is offering at 4s. 4d., in bond. Californian, spot, one case, 4s.; two or more cases, 3s. 10d.; small drums, 3s. 9d.; large drums, 3s. 8½d. per lb., with some business reported.

PALMAROSA.—The shipment market is reported to be extremely firm and that bids close up to 8s., c.i.f., have not been accepted. One shipment offer at 11s., c.i.f. On spot holders report 9s. paid. In view of the strong forward market spot holders are reserved and not anxious to sell; value nominal at 10s. per lb.

PATCHOULI.—The latest advice from the source indicates sharply firmer conditions with shipment offers for Singapore oil now up to 16s. 4½d. per lb., c.i.f. In consequence most spot holders have moved up their prices to about 17s. 3d. to 17s. 6d. per lb., as to quantity.

PEPPERMINT.—Quite a good spot demand with prices ranging from 5s. 3d. to 5s. 4½d., and these prices are cheap compared with the forward market. Japanese shippers are quoting January-March from 5s. 9d. to 6s. per lb. and report the market very firm. There are re-sellers of January-March with 5s. 3d. paid with considerable business; sellers now firm at 5s. 4½d., c.i.f. Some October-December oil with buyers at 5s., c.i.f. CHINESE oil on spot sells slowly at about 5s. per lb. New crop, January-February shipment, reported sold to the Continent at 5s. 6d. per lb., c.i.f. The American natural oil is quoted for shipment at about 2 dollars 30 to 45 cents per lb.; c.i.f. spot supplies are offered at comparatively cheap prices with business quiet.

PETITGRAIN.—Market continues fully steady at the recent advances, fair business reported: spot, cases, from 4s.; smaller parcels, up to 4s. 4½d. per lb., ex store; shipment, firm at 3s. 9d. per lb., c.i.f.

ROSEMARY.—Owing to the continued lack of supplies, the spot values for good quality Spanish oils are firm from 3s. 4½d. to 3s. 10½d. per lb., as to quantity, ex store. No shipment offers.

SAFROL.—A further advance is recorded with spot firm from 1s. 11d. to 2s. 3d. per lb., as to quantity.

SANDALWOOD.—Genuine East Indian Mysore, 19s. per lb., in one-case lots on spot; oil described as British Indian at very competitive prices. English-made East Indian, 22s. 6d. to 25s. per lb., as to quantity. English-made West Indian, 7s. 3d. per lb. Australian oil continues steady: five cases, 14s. 6d.; one case, 14s. 9d.; 7-lb. tins, 15s. 3d. per lb.

SASSAFRAS.—Moderate small parcel business on spot with natural oil quoted from 3s. 5d. to 3s. 8d. per lb., as to quantity, ex store. Artificial oils at cheaper prices.

SPEARMINT.—Market has remained rather quiet, values unchanged. Spot, 8s. 10d. to 9s.; shipment, 8s. 4d. per lb., c.i.f.

SPIKE.—Spot quotations for genuine Spanish oils of good quality are firmly held at recent advances, ranging from about 5s. 9d. to 7s. 6d. per lb.; shipment nominal. French oil, spot, 7s. 6d. to 8s. per lb., ex store, as to quantity.

VETIVERT.—Dealers' prices for small parcels of Bourbon continue from 27s. 6d. to 30s. per lb.; shipment, about 22s. 6d. per lb., c.i.f.

WORMSEED.—The shipment market is sharply dearer with U.S.P. quality oil now firm at 9s. 2d., c.i.f. Most spot holders have advanced their prices to about 9s. 4½d. to 9s. 6d. per lb., as to quantity.

Imports and Exports, 1934-1936

IMPORTS of essential oils for the years 1934-1936 were as follows:—

From	1934	1935	1936	1934	1935	1936
	Lb.	Lb.	Lb.	£	£	£
British India...	168,573	235,594	278,301	63,975	74,657	76,802
Other British Countries ...	997,023	960,153	1,050,455	107,212	108,562	129,418
France ...	339,348	337,691	420,198	254,658	273,527	288,272
Italy	593,241	810,716	102,191	127,960	207,727	41,934
Other Foreign Countries ...	2,041,131	2,173,371	2,438,660	309,424	390,526	421,425
Total ...	4,139,316	4,517,525	4,289,805	863,229	1,054,999	957,851

Exports of British manufactured essential oils during 1936 totalled 406,168 lb., valued £199,271. Re-exports of essential oils during 1936 totalled 656,488 lb., valued £205,921, compared with £239,833 and £175,509 in 1935 and 1934 respectively.

Correspondence

Correspondents may adopt an assumed name, but must in all cases furnish their real name and address to the Editor

Chemists' Friends Scheme

SIR,—In connexion with our work on the Chemists' Friends scheme we examine the literature which is being circulated to chemists by manufacturers of proprietary medicines. The phrasing of these circular letters is very significant of the success of the C.F. There is little doubt that the united front which retail chemists are putting up, and their determination to be masters in their own house, is already having very great effect on those manufacturers whose policy in the past has been to use the chemists' windows, counters and professional recommendation as one of their cheapest advertisements, and every other channel for the distribution of their products. Two or three amongst many such circulars received may be quoted. "Please display our showcard . . . will be of definite assistance in linking up with our advertising," "Your co-operation is earnestly solicited" and "Assuring you of our earnest desire to co-operate with you to our fullest extent," and last but not least "Singled out for your professional recommendation." Furthermore, so concerned are some of the larger patent-medicine manufacturers that special representatives have been sent round solely to leave showcards and try to arrange displays with chemists who, in the past, have too readily lent their windows for this purpose.—Yours faithfully,

J. EVANS, Chairman;
JOHN B. SIMMONS, Hon. Treasurer;
W. HEAP, Hon. Secretary.

N.P.U., Cambridge and District Branch.

SIR,—In your editorial article on p. 63 of last week's issue, you allude to matters which are no doubt in the minds of most pharmacists at the present time. Public Enemy No. 1 is influenza, which has many in its grip, including members of all sections of the trade. I hear of overworked retail chemists who are swamped with N.H.I. scripts and wholesalers whose delivery vans remained idle for hours because goods were not ready owing to depleted staffs. Let no one grumble at this extra work; there has been too little of it recently. I have watched the progress, for progress it is, of the C.F. scheme with deep interest. If it does not develop at such a rapid rate as was expected, it is not due to lack of effort on the part of Mr. Mallinson or the C.F. Committee. It is to retailers and to retailers only that we must look for that push which has yet to be given if the scheme is to be a success. They must put pressure on those manufacturers who appear to be sitting on the fence. We have the verdict of those who have already joined that they are satisfied; why should not the number be doubled during the present year?—I am, etc.,

OBSERVATOR (18/1).

The Services the Chemist Gives

SIR,—I was interested to read the letter by "Emergo" (*C. & D.*, January 16, p. 72) on the subject of service. My experience, too, has often made me wonder whether the public are under the impression that chemists receive a fixed State remuneration for services rendered. Within the last few months I have had emergency calls from people who, curiously enough, never enter my pharmacy during normal hours of business. Two such calls were late at night, being requests for a remedy to arrest bleeding after extraction of teeth. Another was for the removal of a splinter, and yet a further one was for sal volatile. On each occasion I had to make the journey from my house to the shop. Then there are the folk who come, out of business hours, with N.H.I. scripts. Where do all these people purchase the pharmaceutical goods which they surely need at some time or other? I can only conclude that they visit the chain shops or the local drug stores. However, I never refuse help if it can be given; not from any motive of ultimate gain, but merely from a willingness to lend a hand. An oddly amusing situation arose one Sunday evening last summer. A motoring family, directed to my house, asked for a tin of a certain food for the infant. I did not stock that particular brand, so I rang up a brother chemist and asked him to expect a customer. I then directed the motorist to the other shop. The food was purchased, the family returned to my house, and my wife assisted the mother in preparing the baby's supper! That case was exceptional, and the travellers were very grateful. The annoying cases are those in which our own townspeople make use of me in an emergency—usually at highly inconvenient moments—and yet never think of reciprocating by bringing their ordinary custom. However, I realise that my experiences in that direction are not exceptional.

Yours faithfully,

RURAL CHEMIST (18/1).

SIR,—"Service," a very good word in itself, stands for a gesture which, as usually made, is praiseworthy. It can, however, be abused. There is probably a good deal of nonsense talked about the chemist being "the servant of the public," but that there is a good deal of truth in the remark is proved by the way in which people instinctively rush to him in times of panic or when some accident has taken place. I remember one Sunday morning, just as I was starting for church, being detained by several people coming into the pharmacy carrying a girl who had suffered a concussion through a bicycle accident. I missed the service, called up the ambulance and went with the girl to the hospital. The next day the driver of the ambulance called in and asked for his tip! Nobody expected me to charge for my services. Did I not run a chemist's shop, and had not chemists from time immemorial done such "good deeds" without the hope of fee or reward? The strange thing is that members of the public do not expect to get similar treatment from the shops of the "multiples," nor, apparently, do they bear them any ill will because of their failing to give it. The truth is that we have brought this state of affairs on ourselves. The practice started when overheads were low and when the pharmacist had often not enough to do; it is high time that a stand is made and a charge requested that shall go some way to recompense him for his trouble. Does the medical man forget to charge his patient if he is called up in the middle of the night, although he may not leave his house? Why should the chemist be at the beck and call of members of the public unless he also makes a modest charge for corresponding services?—Yours, etc.,

CALLED OUT (19/1).

An Unchanged Policy

SIR,—In view of certain inquiries received by post or by word of mouth regarding our intentions in respect of the supplies of our products to the wholesale houses in this country, we feel it would be acceptable to all concerned if we made it quite clear through the courtesy of your journal. We do not intend or contemplate making any changes in the policy of supplying legitimate wholesale houses whose co-operation we value for the distribution of our goods. We believe that the wholesaler who respects price maintenance and helps the manufacturer to enforce it renders a definite, valuable service to the retailer, as well as to the public, especially in the case of a manufacturer whose large range of products would make it difficult and uneconomic for the retailer to carry an excessively large stock or force him to miss a number of small sales which, in the end, are a source of income to all concerned, which is not to be despised.—Yours faithfully,

COTY (ENGLAND), LTD.,
London, W.1. C. C. VALLI, Managing Director.

Unethical Advertising

SIR,—It may be that the advertisements for medicinal proprietaries are not quite so blatant now as they were at one time (*C. & D.*, January 16, p. 51). The effect is aimed at by more subtle suggestions; a recent fashion of advertising is by pictorial methods—a series of sketches showing how the feeble invalid becomes full of bounding health after trying some wonderful product, or how a junior employee is promoted to managing director in a few weeks. Pictorial advertisements of the kind referred to appear in many sorts of papers; and if an ethical standard is adopted, the illustrated tales should have some elements of probability. With regard to chemists giving advice when selling advertised proprietaries, I consider this rests largely with the customer. Some ask for a certain article, others expect guidance.—Faithfully yours,

CHLOROPOT (18/1).

Miscellaneous Inquiries

We do not undertake to analyse and report upon proprietary articles nor to publish supposed formulas for them

D. W. (28/12).—Branding fluid.—A sheep- and cattle-branding fluid of the type you have in mind could be made by rubbing up lamp-black, Venetian red or Prussian blue with boiled linseed oil or a base made by boiling together 2 oz. each of borax and shellac in a pint of water.

R. S. C. (12/84).—(1) Dyspepsia tablets.—The formula for which you ask is as follows:—

Bismuth carbonate	8 oz.
Magnesium carbonate (heavy)... ...	35 oz.
Sodium bicarbonate	8 oz.
Powdered gum acacia	10 oz.
Sugar	80 oz.
Oil of cinnamon	120 grs.
Spirit of chloroform	2 fl. dr.

(2) Sulphur effervescing salts.—We suggest you experiment with the following formula:—

Flowers of sulphur	20 lb.
Powdered sugar	112 lb.
Tartaric acid	10½ lb.
Sodium bicarbonate	7 lb.
Oil of lemon	⅛ oz.

The amount of sulphur can be adjusted to suit your requirements.

R. L. (15/81).—Recovering silver from photographic baths.—The process in general use is to add liver of sulphur to a large bulk of waste solution when the silver is deposited as silver sulphide. This should be allowed to collect at the bottom of the vessel, and the clear liquid siphoned off, more used baths being added from time to time. When a large bulk of precipitate is obtained, it should be collected, drained and sent to the refiners for the recovery of the silver. Precipitation with zinc dust, although not so rapid, is efficient and does not evolve objectionable fumes. Since the hydrogen sulphide affects photographic materials, operations should not be carried out in the vicinity of them. This trouble can be overcome by making the bath alkaline with caustic soda before adding the sulphide. A convenient way of dealing with the sludge for conveyance is to mix it with sawdust.

E. D. C. (15/81).—Sunday trading.—After May 1 a chemist's shop may be kept open for serving customers on a Sunday with medicines and medical and surgical appliances only. These articles may be supplied only at premises registered under Section 12 of the Pharmacy and Poisons Act, 1933, or by any person who is under contract with a National Health Insurance Committee for the supply of drugs or appliances. Where a shop is situated at a holiday resort some further latitude may be conferred. An employee may not be engaged in the shop for more than three Sundays in any one calendar month, so that if there happen to be five Sundays in a particular month the employee will be entitled to two Sundays off. Employment on a Sunday will further entitle the employee to a holiday corresponding to the usual Sunday holiday. If he is employed on a Sunday for more than four hours, the employee will be entitled to a full day's holiday on one day in the week either preceding or following the Sunday of his employment. If, however, he is employed for less than four hours on a Sunday, he will be entitled to a half-holiday on one day in the week either preceding or following the Sunday of his employment. This full-day or half-day holiday, as the case might be, will be in addition to the customary half-day holiday in the week. There is a special exemption, however, in favour of a registered pharmacist who is under contract with an Insurance Committee, and who is required by his contract to keep open on a Sunday. Such an employer will be entitled to retain an employee on alternate Sundays only for two hours without being obliged to give his employee any holiday other than the ordinary statutory half-day to which employees in general are entitled, provided the following conditions are fulfilled:—(1) The employee may not be employed for more than two hours on such alternate Sundays; he must not, of course, be employed at all on an intervening Sunday. (2) He must have had in the week preceding the Sunday of his employment or he must be entitled to have in the week subsequent to that Sunday, a "short day."

J. W. (6/48).—Dust in power station.—It is not clear whether you require a preparation for keeping down the dust which enters the generating station through doors or windows, or whether it is for dust rising from the concrete flooring. Since it is customary to filter air which enters a generating station, we presume the source of the trouble is the concrete flooring. In the circumstances we suggest you try either of the following treatments:—

I

Mix one part of sodium silicate with four or five parts water. Brush or sprinkle the floor well with this solution and allow to dry. Then after four hours and within twenty-four hours wash clean with clean water. Repeat the treatment three times.

II

To ten gallons of cold water add one fluid ounce of sulphuric acid. Heat the liquid to boiling point and stir in 25 lb. of sulphate of alumina. Let the solution cool and strain. Sweep and thoroughly wash the concrete surface. After drying, apply the hardener in four applications of varying strength, ranging from 30 per cent. solution and 70 per cent. water up to 100 per cent. solution. The above quantity suffices for the complete treatment of an area of from 50 square yards to 10 square yards, depending upon the porosity of the surface treated.

B. S. (11/88).—Indigestion and liver tonic.—The formula for indigestion and liver tonic, P.F. 112, is as follows:—

Ext. nuc. vom. liq.	℥ij.
Inf. quass. conc.	℥iiss.
Ac. nit. mur. dil.	℥vj.
Chloroform	℥j.
Inf. gent. conc.	℥xij.
Aq. ... ... ad	℥cxliv.

Dose: ℥ss. ter in die ex aq. post cibos.

This was published in *The Chemist and Druggist Diary*, 1921.

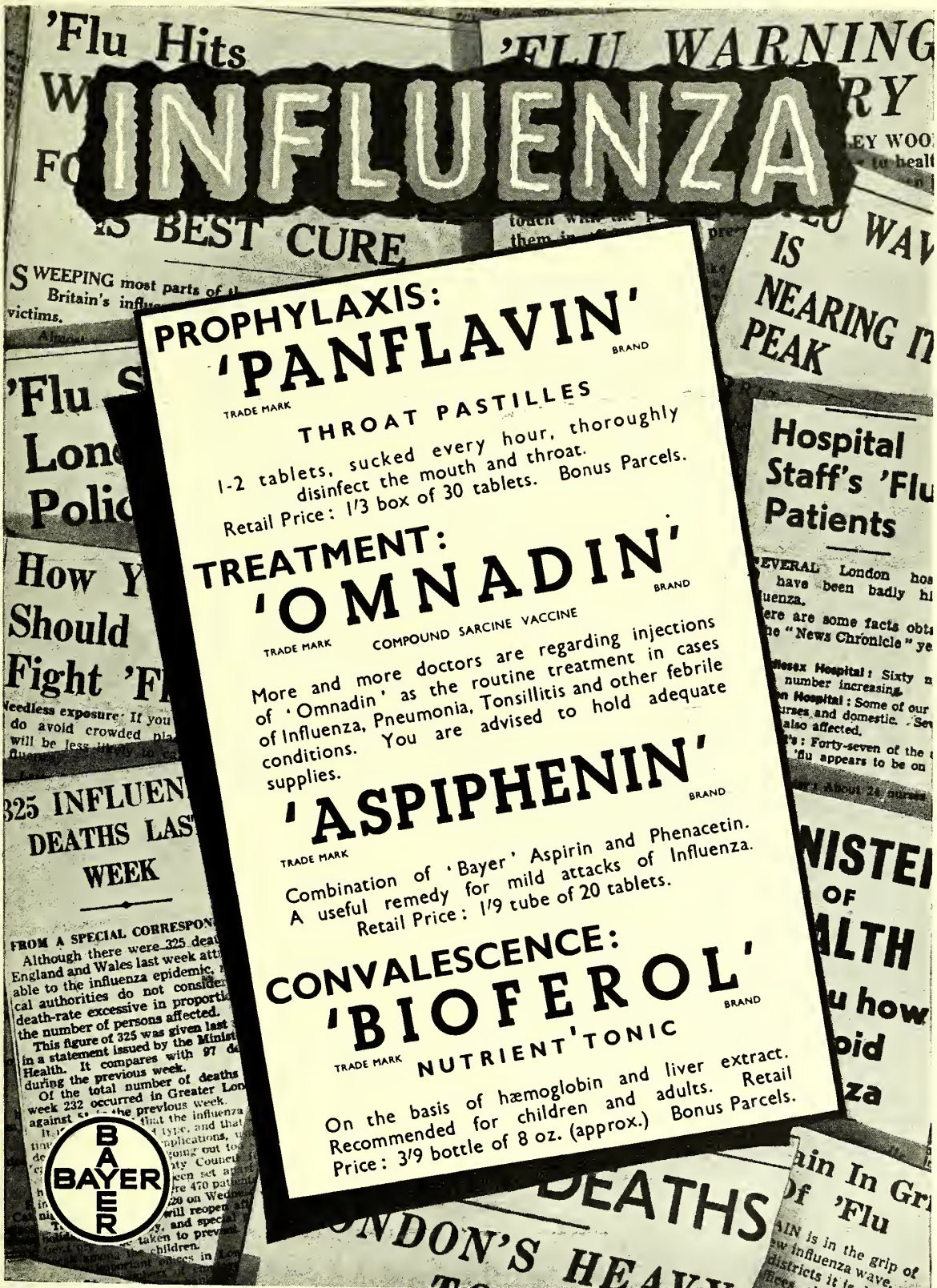
P. M. B. (6/24).—Early closing notice.—The *C. & D.* Shops Act Card will meet your requirements. This measures 14 inches by 10 inches and states that "This shop is closed for to-day except for the sale of medicines and medical and surgical appliances." On the reverse side is information relating to the Shops Acts, 1912-1928. The price is 1s., post free.

Retrospect of Fifty Years Ago

Reprinted from
"The Chemist and Druggist," January 22, 1887

A Royal Commission on Trade

At last we have an authoritative exposition of the condition of British trade. A very full summary of the final report of the Royal Commission which investigated this important subject has been made public . . . . The Commissioners have ascertained that a good many people, including many of those who gave evidence before them, considered that trade was in a depressed state. But exactly what this depression meant was not quite such an easy investigation. The volume of our trade has not diminished within the past few years. . . . The progress of foreign competition is, of course, noted, and with it the report administers very tenderly a rebuke to British merchants. The Commissioners "cannot avoid stating their impression that there is some falling off among the trading classes of this country from the more energetic practice of former periods." The influence of the limited liability principle introduced into commercial operations as tending to reduce the scale of profits is very appositely referred to. . . . Beyond a few ordinary copy-book maxims the Commissioners have little to recommend. They are good enough to believe that "with the same physical and intellectual qualities which gave us so commanding a lead," combined "with care, intelligence, enterprise and thoroughness," we may "continue to advance"—a form of phraseology which inevitably recalls the stereotyped tradesmen's circular in which "the undersigned hopes by strict attention to business to merit a continuance of the favours so liberally bestowed on his predecessors."



THE PROOF OF THE PUDDING.....

LONDON
Dec. 28, 1936

"I put Brustine Bon-Bons in
"my window Monday morn-
"ing last and at the rate
"they are selling my 28 lbs.
"should be gone by Satur-
"day. Please send off at
"once 4 cases.

Yours etc.
....."

This spontaneous letter from an enterprising London chemist is the best proof you can want that "Brustine" is a real winner. What other line sells at this rate and shows such a handsome profit. There is everything to help you—show material, clockwork display stand, free samples, etc.—and once tried your customers will always buy "Brustine."

. . . and they show 50% on cost!

Brustine BRAND

NOSE & THROAT

BON-BONS

★ HOW THEY SELL

Brustine Bon-Bons aresold through Chemists only at a fixed retail price of 6d. per qtr. They show a profit of 50% on cost. With every initial order we will send a unique clockwork Sales Bringer which is yours for as long as you wish. This and other show material, together with the free samples sent with every order, will quickly attract highly profitable sales and their efficacy will guarantee your repeat business.

★ HOW THEY'RE PACKED

Brustine Bon-Bons are sold in 28 lb. case units containing 14 lbs. of each kind packed in 7 lb tins They are supplied loose, but with every case will be sent FREE 112 printed bags (to hold ¼ lb.). 50 samples packed for FREE distribution and with every order for 10 cases ONE CASE WILL BE SUPPLIED FREE IN ADDITION.

Get on to Brustine whilst FLU is about

BRUSTOC LIMITED
JOHN STREET, WARRINGTON

NOW £270 in Prizes for Chemists

You can win £50 and £20

You could not have a better time for the competition than this. It is the worst season of the year for health—*and* there is an influenza epidemic. You can expect to sell more Brand's Essence because of your window display, even if you don't win a prize: and why shouldn't *you* be one of the winners? Remember the area prize-winner whose display is judged the best gets the £50 first prize *as well as* his area prize of £20—so you have a good chance of winning £70 in all. Every entrant, whether or not he wins a prize, will receive a complimentary hamper containing:—9d. Bottle A.1. Sauce, 5½d. Meat Paste, 5½d. Fish Paste, 7d. Tin Oxtail Soup, 7d. Tin Cream of Chicken Soup, 2/1d. 4 oz. Brandox, 10½d. Arabian Sweet Pickle, 2/3d. Calf's Tongue, 4½d. Table Jelly, 10½d. Salad Cream.

1st. PRIZE £50

6 SPECIAL AREA PRIZES of £20 each

for

London, including Middlesex, Berkshire and Surrey; South Coast; South West; Midlands and Eastern Counties;
N. England and N. Wales;
Scotland.

50 CONSOLATION PRIZES of £2.2.0 each

(8 for each area and 2 extra)

AND A HAMPER OF BRAND'S DELICACIES for every entrant.

All you have to do is this:

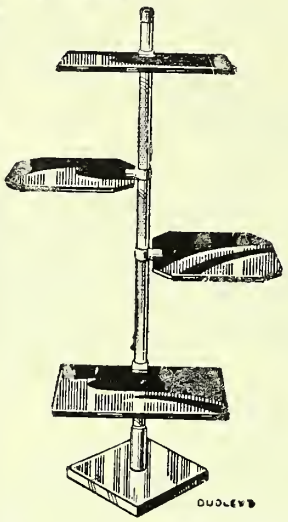
Send for as much Brand's Essence display material as you will need—showcards, cut-outs, dummy cartons, and display containers: we shall be pleased to supply all that you need FREE. Prepare your window display and have the display photographed. If you have not already received an entry form ask our traveller or send for one immediately. Fill it up, and dispatch it *with the photograph* to Brand & Co. The photograph may be any size convenient for you.

Competition terms:

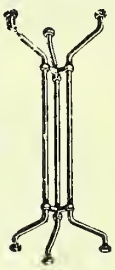
1. A good window display (not necessarily a whole window) of Brand's Essence for at least 14 days commencing before the end of February, 1937.
2. Last day for receiving photographs and entry forms, Monday, March 1st.
3. The judges' decision shall be final and no correspondence will be entered into regarding the competition.
4. Photographs cannot be returned unless accompanied by a stamped addressed envelope.
5. Brand & Co. Ltd. reserve the right to reproduce any photographs submitted.

BRAND'S ESSENCE
FEBRUARY
WINDOW DISPLAY COMPETITION

DISPLAY FITTINGS



Send for our fully illustrated List No. CD. 1695. Brimful of interest to you.



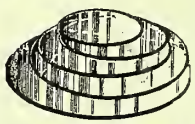
No. C D.F. 5616 Brown Bronze Tripods

	s. d.
9"	1 6 each
12"	1 9 ,,
15"	2 0 ,,
18"	2 3 ,,
24"	3 6 ,,

Chrome finish

	s. d.
9"	2 6 each
12"	3 0 ,,
15"	3 9 ,,
18"	4 6 ,,
24"	6 0 ,,

No. C D F. 5739. The latest Glass Rod Display Stands. The centre stem is a 24" Crystal Glass Rod mounted on heavy Chromium Plated Base—complete with 4 Black Glass Shelves.
2' 7" × 7" } adjustable to
2' 9" × 5" } any position.
18/6 each *Carriage Extra*



No. C.D.F. 1015 New ¼" Glass Ovals

	s. d.
11" × 5"	1 3 each
12" × 9"	1 6 ,,
14" × 10"	1 9 ,,
18" × 12"	2 6 ,,

DUDLEY & COMPANY LIMITED
453 Holloway Road, London, N.7
City Showroom: 65 Fore Street, E.C.

GLYCERINE

The Purest Quality on the Market. Produced by
THOMAS HEDLEY & CO. LTD., TRAFFORD PARK
Chemically Pure B.P. Industrial White. Pale Straw.
Sole Distributors:
FREDK. BOEHM LTD., 17 Jewry Street, London, E.C.3.
and 140 West George Street, Glasgow.

URICURE TABLETS

The greatest of all Rheumatic remedies
A LINE THAT ONLY CHEMISTS CAN SELL
1/3 size, 7/-; 3/- size, 17/6; 5/- size, 25/- per doz.
The Acton Pill & Tablet Co. Ltd., Ash Vale, Surrey

VISCOSITY

While Specific Gravity is useful as a means of grading Liquid Paraffin, Viscosity is the true test of quality.

As specialists in this material we can offer an Oil with a Viscosity of 290/300 seconds at 100° F.

"QUALITY COUNTS"

C. E. THURLEY & SON
UNITY WORKS
LATIMER ROAD E.7

'PHONE: MARYLAND 4666

VICHY-CÉLESTINS

The world renowned NATURAL Mineral Water.

(And the other State Springs of Vichy)

We beg to remind the Trade that the above are on the P.A.T.A. list and show a good return to retailers.

These waters are largely prescribed by Physicians, and Chemists would do well to have an ample stock on hand.

Pamphlets, Show Cards and Dummy Bottles forwarded on application.

CAUTION—Each bottle from the STATE SPRINGS bears a neck label with the word "VICHY-ETAT" and the name of the

SOLE AGENTS:—

INGRAM & ROYLE LTD.

Bangor Wharf, 45 Belvedere Road, London, S.E.1

And at LIVERPOOL and BRISTOL

Telegraphic Addresses :

"Ingram-Royle Watloo, London."	"Sprudel, Bristol."	"Celestins, Liverpool."
'Phone : WATerloo 4343 (2 lines).	'Phone : 21913.	'Phone : Bank 4528.

The CHEMIST AND DRUGGIST SUPPLEMENT

This Supplement is inserted in every copy of The Chemist & Druggist

28 ESSEX STREET, LONDON, W.C.2

JANUARY 23, 1937

ADVERTISEMENT TARIFF

ALL ADVERTISEMENTS are PREPAID, so that remittance must accompany instructions in each case. If it be necessary to telephone or telegraph an urgent announcement this may be done, provided the money is telegraphed at the same time.

BUSINESSES WANTED and for DISPOSAL, PREMISES TO LET and FOR SALE, PREMISES WANTED, PARTNERSHIPS, GOODS for SALE and AGENCIES—6/- for **50** words; every additional **10** words or less, **6d.** (Box No., **1/-** extra.)

SITUATIONS OPEN—6/- for **40** words; every additional **10** words or less, **6d.** (Box No., **1/-** extra.)

SITUATIONS WANTED—2/- for **18** words; every additional **10** words or less, **6d.** (Box No., **1/-** extra.)

LEGAL NOTICES, TENDERS, AUCTIONS, and all specially-spaced announcements, **1/3** per nonpareil line (12 lines = 1 inch single column). (Box No., **1/-** extra.)

MISCELLANEOUS (Wholesalers') Section for odd and second-hand lots—**10/-** for **60** words: **1/-** for every additional **10** words or less. (Box No., **1/-** extra.)

EXCHANGE COLUMN (for Retailers, etc.)—**Twopence** per word, minimum **2/-.** (Box No., **1/-** extra.)

REPLIES FROM ADVERTISERS—1/- per line; **3** lines **2/6.**

THE CHEMIST & DRUGGIST, 28 Essex St., Strand, London, W.C.2

Telephone: Central 6565 (10 *lines*). *Telegrams: "Chemicus, Estrand, London."*

CLOSING FOR PRESS

must reach us not later than FIRST POST THURSDAY MORNING

All advertisements intended for insertion in this Supplement

BUSINESSES FOR DISPOSAL.

6s. for 50 words or less ; 6d. for every additional 10 words or less, prepaid. (Box No., 1s. extra.)

BURNLEY, LANCS.—For Sale, owing to death, Chemist's Business and centrally situated Shop; established over 100 years. Particulars Steele, Solicitor, Burnley.

LONDON.—Chemist leaving Pharmacy immediately wants to Sell his Business quickly; £250; clean, comprehensive stock; well-fitted shop; increasing returns, increasing N.H.I.; living accommodation; an unusual offer. 219/3, Office of this Paper.

MIDDLESEX, N.—Good Business in healthy, growing district; Dispensing, Prescribing, good Toilet, N.H.I., Kodak and Selo Agencies; good flat attached; shop well fitted and heavily stocked. 294/654, Office of this Paper.

SEVENOAKS.—Cash Drug Stores, occupying prominent position in main thoroughfare; excellent scope and opportunities; living accommodation; £250 or near reasonable offer; genuine reason for disposal; full particulars upon application. 220/27, Office of this Paper.

WEST OF ENGLAND.—Chemist's Business for Sale in popular seaside resort; turnover average last 3 years, £1,640; special reasons for selling and a good opportunity for a smart Pharmacist; incoming about £850. Particulars to Solicitors or Principals, 219/9, Office of this Paper.

ALL AT £250 (or stock and fixtures at valuation).—Drug Store; established 3 years; near Reading; nearest Chemist 2 miles; sure living for Qualified man; present trade £9 a week; population 1,700; good house and garage; rent £60 a year; 21 years' lease, or premises could be purchased. 218/14, Office of this Paper.

OLD-ESTABLISHED Chemist, main road, S.W.; well equipped; trade £1,500 per annum; good accommodation; good Panel and trade; nice district; excellent business; price £750, or reasonable offer for quick sale, includes £300-£375 stock, fixtures, etc. Currie & Co., 188A High Street, Clapham, S.W.4. Tel.: Mac 1077/8.

£50 INCLUSIVE.—Well-fitted, good stock of Drugs and Shop Rounds, D. and P. Photographic and Kodak Agency; opposite Euston Station and Railway Clearing House; double-fronted shop; dwelling-house of 4 rooms and large basement; all the rooms are in good condition. Young, 116 Seymour Street, N.W.1.

BUSINESSES WANTED

LONDON or Near.—Advertiser wishes to negotiate for Business doing about £20 weekly. Particulars, in confidence, to "Chemist," 4 Gunterstone Road, London, W.14.

SOUTHERN COUNTIES.—A Profitable Chemist Business required, town or country; must show assured living and prospects; living accommodation essential; veterinary work not objected to; good price paid for right place; early completion date, or wait vendor's convenience; cash buyers of substance. Coxhill & Mitton, 101 Old Christchurch Road, Bournemouth.

ADVERTISER wishes to Purchase Sound Business; turnover £1,500 upwards; living accommodation essential; audited accounts; Leicester or neighbourhood; no agents. 219/13, Office of this Paper.

PHARMACIST with available capital would like to get into touch with fellow craftsman who wishes to dispose of Business; country district, Sussex, Surrey, Hants, preferred, hut not essential; turnover £3,000-£4,000; living accommodation; communications will be treated with confidence, and visit arranged where suitable; deferred arrangements made if desired; banker's reference available. Ford, 34 Osterley Mansions, Osterley, Middlesex.

PREMISES TO LET

BRIGHTON.—Premises to Let; closed down owing to retirement from company of M.P.S. director; rent £55 per annum, on lease; lock-up shop; handsome front and window enclosures; electric fittings, etc.; good opportunity for young man; late proprietors require £50 for their fittings. Apply: Laurence Kingston, Ltd., 54 Preston Road, Brighton, 7.

KINGUSSIE, Grampian Health Resort.—To Let, Shop, 32 years a Chemist's business; house of 5 rooms, kitchen, pantry, bathroom, electric light, garden; best situation in the town. Further particulars C. Strachan, Kingussie.

PARK ROYAL TUBE STATION.—Chemist required for Lock-up Shop; prominent position, adjoining station, on main road, and at bus terminus; low rent; assistance will be given to good-class trader. Apply Brendons, Ltd., 4 Hanger Green (adjoining Park Royal Tube Station), Ealing, W.5. Telephone: Perivale 4409.

RUSTINGTON (near Littlehampton).—New Shops to Let; fast-growing residential area; with or without living accommodation; corner main-road position; meeting immediate demand; excellent opening for Chemist; 3 left only; rents from £90 per annum exclusive. Full details Onslow Estates (Worthing), Ltd., 13 Liverpool Gardens, Worthing.

WELLING, KENT.
(Population over 60,000.)
WONDERFUL SCOPE FOR
CHEMIST AND DRUGGIST.
SHOP, WITH LARGE FLAT OVER,
in a fine parade in the very centre of shopping area.
REASONABLE RENT
on usual lease.
Apply
THE MORRIS DEVELOPMENT CO., LTD.,
130 Mount Street, Berkeley Square, W.1.
Telephones: MAYfair 3378 and 4221.

CHEMIST.—Splendid opening in block nearing completion, Goodmayes; exclusive position; literally surrounded by houses away from competition; good shop with two-floor flat above; £100 a year to start. Apply to owner, Mr. H. H. Dartnall, High Stone, Leytonstone.

LOCK-UP Shop (particularly suitable for Chemist) available at low rent at large housing estate; seven Doctors. Full particulars from Savoy Cinema, Wakefield.

OPPORTUNITY OCCURS to establish a Business in a well-developed and rapidly growing district near Hounslow; only one shop now left on a Parade which occupies a commanding main-road corner position; a Chemist is urgently needed by the district and should be instantly successful; the accommodation comprises large sales shop and a self-contained flat above of four good rooms, kitchen, bathroom, etc.; the rent is £125 per annum exclusive on lease. Apply to John Allsop, Sole Agent, 433 Great West Road, Hounslow. Tel.: Hounslow 2620.

SHOPS (with living accommodation) to be Let in valuable and rapidly improving positions at Banstead, Worcester Park, North Cheam, Ewell, Stoneleigh, and Ilford; rents from £135 per annum. Full particulars from Messrs. Atkinson & Marler, Surveyors, 12 Broadway, Stoneleigh, Ewell, Surrey. Telephone: Ewell 2145-6.

SHOP to Let, lease for disposal; most suitable for Chemist; main shopping street. Apply Milner, 31 Preston Street, Faversham.

Opposite

WOOLWORTHS, SAINSBURYS, BOOTS, TRUEFORM, etc., and adjoining multiple Dyers and Cleaners, Radio and Electrical Dealer. Frontage 18 ft. 6 ins. Depth 40 ft. Self-contained maisonette over. Rent £175. Shop front installed. Apply Healey and Baker, 29 George Street, Hanover Square, W.1.

Telephone Mayfair 2965.

ONE SHOP ONLY AVAILABLE.

APARTMENTS

THE HAMPDEN RESIDENTIAL CLUB

FOR GENTLEMEN, Hampden Street, N.W.1. Close to King's Cross and Euston. 300 Bedrooms. 12s. 6d. to 25s. per week, including bath, attendance and boot cleaning. All meals à la carte in dining room. Moderate tariff. Large Club Rooms, Library, Billiards Room, Reading Room and Study for Students. Illustrated Prospectus from Secretary. Euston 2244/5.

PATENTS

BRITISH LICENCE FOR SALE

for the Manufacture of a Dry Reagent for Urinal Analysis for Glucose, Albumen (quantitative and qualitative), Pus, Blood (also from excrementa), Bact. Coli and Bilirubiue.

The reagent acts without boiling or acids upon a single drop of urine and within a few minutes gives a correct result. It is being marketed on the Continent either in individual tubes, or as a so-called "dry-laboratory" for use when visiting patients. Ample clinical reports and medical testimonies are available.

Enquiries from suitable pharmaceutical manufacturers are requested to 295/657, Office of this Paper.

TENDERS

THE Director-General, India Store Department, Belvedere Road, Lambeth, London, S.E.1, invites tenders for:—

Schedule 1: 54,000 lbs. Lint, Plain.
Schedule 2: 4,700 lbs. Bismuthi Carbonas B.P., 1,764 lbs. Bismuthi Subnitras, B.P., and 370 lbs. Bismuthi Salicylas B.P.
Schedule 3: 54,700 galls. Cresol Saponified, not B.P. or Lysol.
Schedule 4: 18,700 doz. Bottles, Green, Amber and Blue, ½ oz. to 4 lbs.

Tenders due 9th February, 1937.

Forms of tender obtainable from the above at a fee (which will not be returned) of 5s. for each schedule.

COMPANY REGISTRATION

CHEMISTS and their friends must have often wondered *re* the advantages or otherwise of a Private Limited Company. After 25 years' experience you can rely on my free advice; you will not regret following it. Quotation inclusive. All correspondence confidential.

A. B. SLACK,
721 PRINCESS ROAD, West Didsbury.

BUSINESS OPPORTUNITIES

A CHEMIST of British and Continental experience, who is shortly opening a manufacturing laboratory in U.S.A., is prepared to undertake, under licence, the manufacture of proprietary articles, which are already being marketed in America, thus avoiding import duty. Interested principals are invited to communicate in confidence with P.C.B., 230/30, Office of this Paper.

AGENCIES

6s. for 50 words or less; 6d. for every additional 10 words or less, prepaid. (Box No., 1s. extra.)

LONDON Manufacturers of Surgical Latex Goods require Agents with connections in London and in all parts of the United Kingdom. Write, stating territory and commission required, 218/12, Office of this Paper.

ADVERTISERS invite enquiries from Manufacturing Chemists with a view to marketing a certain fairly well-known and old-established registered brand of Pills, or would consider the formation of a syndicate for this purpose; only those genuinely interested need apply. Apply 220/38, Office of this Paper.

SOLE Distributor or Buying Agent for reliable German Pharmaceutical Preparations wanted; also suitable for Mail Order Business; interesting literature will be provided; competitive prices. Replies 294/652, Office of this Paper.

SOLUBLE Sanitary Towels.—Johannesburg Distributor requires sole selling rights for the Union of a High-Class line; excellent credentials. Reply in first instance to 294/639, Office of this Paper.

PARTNERSHIPS

ADVERTISER (40), linguist, energetic, hard worker, long Retail, Manufacturing and Marketing experience, seeks active Partnership; Retail preferred, but others entertained; only a well-established and sound business, with real call for expansion, considered; £500 available. Fullest particulars (in strictest confidence) to 220/32, Office of this Paper.

GERMAN Apotheker and Chemist who Manufactures in Germany Pharmaceutical Articles, Cosmetics, etc., seeks a position in England or would join partner with capital to start Manufacture in this country. Write to P.C.B. 231/2, Office of this Paper.

EDUCATIONAL

FOR TUITION in Mathematics, Optics and Sight-testing apply C. V. Bolton, F.S.M.C., F.I.O., 49A Lelgh Road, Leigh, Lancs.

CLERICAL

IMMEDIATE vacancy occurs on the Staff of "The Chemist and Druggist" (London Office) for an experienced Shorthand-Typist with sound knowledge of Office Routine; Drug Trade experience an advantage, but not essential. Applications should state the usual details in full and should be addressed to The Publisher, "The Chemist and Druggist," 28 Essex Street, London, W.C.2.

APPRENTICES

APPRENTICE required, young Lady, having passed Part I preferred. Apply Pharmacist, London Jewish Hospital, Stepney Green, E.1.

SITUATIONS OPEN

RETAIL (HOME)

6s. for 40 words or less ; 6d. for every additional 10 words or less, prepaid. (Box No., 1s. extra.)

CARDIFF.—Wanted immediately, Qualified Assistant, capable of taking charge; must be tactful Salesman and good Window-dresser. Robinson, 134 Whitchurch Road, Cardiff.

LLANDUDNO.—Qualified Young Lady or Man required, with good all-round experience of Dispensing and Photographic; quick worker, with smart Counter manner. Full details and salary required in first letter, and when available, Harold Blades, 68 Mostyn Street.

LLANDUDNO.—Unqualified Lady Assistant wanted at once for Dispensing, Counter and Photographic Sales; must be of good appearance and height; fullest particulars in first application. Miss Horniblow, M.P.S., 4 Queen's Buildings, Llandudno.

LONDON AND PROVINCES.—Several Unqualified Lady Assistants, preferably with good knowledge of Private Trade. Write, giving full particulars, to Box 4518, Frost-Smith Advertising, 64 Finsbury Pavement, E.C.2.

LONDON HOSPITAL.—Assistant Pharmacist wanted; hours 9 till 5 daily; occasional late duty; progressive salary; commencing £200, subject to deduction for superannuation under the Federated Superannuation Scheme. Applications, stating age, date of qualifying and experience, to he made by letter in own handwriting to the Pharmaceutist, London Hospital, Whitechapel, E.1.

LONDON, N.—Wanted, Qualified Assistant for three evenings per week, chiefly for Dispensing (mostly N.H.I.) and assist at Counter; Thursday and Friday evenings from 6 till 8, Saturdays from 6 to 9; age, references and salary required. 220/33, Office of this Paper.

LONDON SUBURB.—Unqualified Assistant, male, young, for Working-class Business; must he a quick and accurate Dispenser, good Window-dresser; salary 50s. per week; commence early February. 219/1, Office of this Paper.

LONDON, W.5.—Qualified; part time; each Wednesday evening and alternate Sunday evening; experienced at Counter and Dispensing; state full particulars, time at liberty and salary. 220/11, Office of this Paper.

SOUTH WALES TOWN.—Wanted, Qualified Assistant, immediately; good experience; please state wages required. 294/650, Office of this Paper.

THAMES VALLEY.—Wanted, competent Man to run a Drug Store (mainly Photographic and Toilets, etc.); no Dispensing; good knowledge Photo necessary; wages 45s. to commence; references required. Reply 219/4, Office of this Paper.

WARWICK.—Qualified Junior Assistant, male; commence earliest convenience; good Dispenser essential. Apply, sending photo and all usual particulars, Charles Pratt, Market Square, Warwick.

CAPABLE Unqualified Assistant required for permanency; must be used to busy N.H.I. and usual shop routine. Reply, with full particulars, references and salary required, Chemist, 1 Church Street, Kidderminster.

EXPERIENCED Unqualified Assistants, reliable Dispensers, required in Gloucestershire; busy Good-class Store. Write Box 4518, Frost-Smith Advertising, 64 Finsbury Pavement, E.C.2.

LADY Assistant, Unqualified, with good Counter and Dispensing experience; state full particulars and salary required. C. H. White, Ltd., Market Place, Oldbury, Worc.

LADY Assistant, Unqualified (25-30); used to good-class trade and thoroughly experienced in modern Pharmacy; permanency. Apply, with particulars of age, salary, experience, photo if possible, Meyrick & Davies, Ltd., Wilton Court Pharmacy, Bexhill-on-Sea.

QUALIFIED Assistant required shortly; state full particulars, age, height, experience, salary expected in first letter; photo if possible. "Grovely," Netherton Road, Weymouth, Dorset.

QUALIFIED Junior wanted, February 22; quick Dispenser, knowledge of Photography; no Sunday or half-holiday duty; comfortable berth for the right man; fullest particulars, age, experience and salary required in first letter. Liner, Chemist, Gt. Yarmouth.

QUALIFIED Lady Assistant for North London Pharmacy. Apply, stating age, salary required, to L. A. S., 306 West Green Road, N.15. 'Phone: Bowes Park 3771.

QUALIFIED Lady Assistant needed for a working-class business, 6 miles from Birmingham. Kiudly send full particulars, when writing, to Bannister & Thatcher, Ltd., 132 Caldmore Road, Walsall.

QUALIFIED Lady Assistant wanted; good Dispenser and Counter Hand; state age, when Qualified, date when free; salary £4 per week and commission; percentage of turnover. S. M. Morris, Ltd., 143 Broadway, Hanwell, W.7.

QUALIFIED Manager, either sex, for village branch in Suffolk; good Stock-keeper and Dispenser essential, to work closely with Medical men; salary and profit-sharing basis to right applicant; house attached to husiness available; an excellent opportunity for keen, energetic worker. 221/8, Office of this Paper.

QUALIFIED Manager wanted immediately, with Optical experience, to take control in South Wales; must he energetic, proved business builder, and furnish undeniahle references; Welshman for preference; full particulars as to experience, with salary expected, in first application; applications not replied to within one week respectfully declined. Rees, Chemist, Port Talbot.

QUALIFIED; suit elderly man; light duties; Walsall district; state age; moderate salary; easy hours; no Sunday or holiday duties. 220/31, Office of this Paper.

SMART young Unqualified Assistant for quick Counter trade; must be capable Salesman. Write, giving full particulars, to Coventry & District Co-operative Society, Ltd., Drug Department, West Orchard, Coventry, before January 28. Endorse "Chemist."

UNQUALIFIED Assistant wanted IMMEDIATELY, male (25-30), for good-class Dispensing, Retail and Photographic business, South Coast; state former experience (giving names of last three positions), height, salary; enclose recent photograph (returnable); must be keen business man, ability for work. 220/44, Office of this Paper.

UNQUALIFIED Junior Assistant, gentleman; reliable Dispenser essential; post offers good salary and first-class general experience. W. Taylor & Co., 442 Finchley Road, Hampstead, N.W.2.

UNQUALIFIED Junior Assistant (male) required; reliahle Dispenser and good Counter experience, for High-Class business. Apply, stating age, height, salary required, previous experience, and when disengaged, 294/640, Office of this Paper.

UNQUALIFIED Junior Assistant required; must be good Window Dresser and Dispenser; please give age, salary required, and when disengaged. Apply, Early Bunn, Ltd , 95 High Street, Chelmsford, Essex.

UNQUALIFIED Junior Assistant wanted; state age, particulars of experience, salary required. Gilbert, Harworth, Doncaster.

UNQUALIFIED Junior required. Apply with usual particulars, salary and if possible photo to Mr. Collier, c/o Whitfield's, 113 Westborough, Scarborough.

UNQUALIFIED Lady Assistant required for Bowes Park, N. district; Dispensing and Counter. Apply J. Edmunds & Co., Ltd., 33 High Street, E.8.

UNQUALIFIED Lady Assistant (young) required for business 16 miles west of London; some experience and pleasant manner essential. Please write, stating age, experience and salary required, to Lutons Chemists, Ltd., 7 High Street, Yiewsley, Middlesex.

UNQUALIFIED young Junior Assistant for Family husiness. Full particulars, experience, salary, etc. (photo if unable to call), to H. C. Neve, 1416 London Road, Norbury, S.W.16.

WANTED.—A competent and experienced Senior Assistant for a good-class Dispensing and Retail business with Optics and Photographics; Optical qualification essential (Registered J.C.Q.O.); must be a good Salesman, courteous in manner and trustworthy; preference given to one desiring a permanent and progressive appointment. Kindly state full particulars of former experience, both Optical and Pharmaceutical, age, height, salary required, and enclose recent photograph (returnable), to "Progress," 220/25, Office of this Paper.

WANTED AT ONCE.—Qualified Man for Light Retail Business near Manchester; middle-aged or young man requiring experience might suit; moderate salary. Apply, giving full particulars, including copies of recent references, to "Radix," 220/23, Office of this Paper.

WANTED.—Qualified Assistant, either sex, as Superintendent; part-time or evenings only might do; good Dispenser and all-round assistance; state salary (moderate), age, etc; small business, near City, London E. Write Marriott, 705 Lea Bridge Road, E.10.

YOUNG Lady Assistant required; knowledge of Counter, Toilet Goods and Window-dressing; give full particulars of experience, age and salary required. Thomas, Chemist, 66 Central Road, Worcester Park, Surrey.

WHOLESALE

LONDON Wholesale Druggists require Assistant in Laboratory; some experience in Compounding. 294/655, Office of this Paper.

REMUNERATIVE new side line for representatives calling on good-class Chemists; exclusive territories; good repeat orders; commission weekly or monthly; high-class product; small samples; vacant territories practically all England. Full particulars, Olia Co., 38 Wyndham Road, Salisbury.

REPRESENTATIVES to call upon Hospitals and Medical and Dental Professions (*a*) in North London and Eastern Counties; (*b*) in South London and South-Eastern Counties. Established connexion to hand over. Applicants should state age, give full particulars of past experience, and say whether car available. 294/623, Office of this Paper.

REPRESENTATIVES wanted for National and Radio Advertised Line; commission basis only. Send details of territory covered, etc., to 294/653, Office of this Paper.

REQUIRED for Scotland and North of England, experienced Representative to call on Doctors, Hospitals, etc., in connexion with Medical Preparations of outstanding merit. Apply, giving full particulars as to age, experience, salary, to 295/656, Office of this Paper.

REQUIRED.—Young, capable Mixer, with knowledge of Drugs, for working in Streatham factory; only those not afraid of hard work need apply. 294/649, Office of this Paper.

TRAVELLERS calling on Doctors and Chemists wanted to handle New Scientific Products on a very generous commission basis. Write in first instance 219/6, Office of this Paper.

WANTED by a well-known firm, for Lancashire, Yorkshire and Scotland territories, first-class Commission Salesmen with connexion amongst Best-class Chemists and who desire to carry one other line; generous terms to the right men. Write with full particulars to 294/651, Office of this Paper.

WANTED, by leading firm of Pharmaceutical and Chemical Manufacturers, Qualified Pharmacist with manufacturing experience on large scale plant; permanent progressive position with good prospects to right man. Give full particulars to 294/638, Office of this Paper.

WANTED.—Male Assistant for Warehouse to Control Stock, Pack Proprietaries and deal personally with the requirements of seven branches; permanency with increase of remuneration for suitable man. Apply, giving experience, references and salary, to H. Hocken, Ltd., Chemists, Redhill, Surrey.

WANTED.—Travellers to carry, as a side line, Westminster Films, calling on Chemists and Photographic Dealers in the areas of Scotland, Cornwall, Devon, South Wales and the Lancashire coast; good commission, part expenses. Apply Westminster Film Company, 8/12 Lambeth Palace Road, S.E.1.

W. H. LEGAT, LTD., Wholesale and Manufacturing Chemists, "Cross Axes," Bolton, Lancs, have a vacancy for a Chemist with a thorough knowledge of the manufacture of Galenicals and Medical Specialities; state experience, age and salary.

COLONIAL, INDIAN AND FOREIGN

SOUTH AFRICA, Qualified Chemist and Optician (age 28-40); must be experienced F.B.O.A. or F.S.M.C., required for first-class Pharmacy, Transvaal; ideal climatic conditions; must be keen salesman, courteous manner and thoroughly competent and trustworthy; good Window Dresser; knowledge of Photography; splendid opening for person with organising ability and able to take complete charge; 2nd class passage paid; 3 years' agreement; salary 1st year, £35; 2nd, £37 10s.; 3rd, £40, per month. Will candidates please apply with copies of testimonials and photograph to MH/Export, S. Maw, Son & Sons, Ltd., 7-12 Aldersgate Street, London, E.C.1.

CHEMIST required for factory near Calcutta, India. B.Sc. (age about 25), single, with some Chemical Engineering and general industrial experience; knowledge of Resins an advantage. Apply by letter, giving full particulars of training and experience, to Box ZP498, c/o Deacons, 5 St. Mary Axe, E.C.3.

SITUATIONS WANTED

RETAIL (HOME)

2s. for 18 words or less ; 6d. for every additional 10 words or less, prepaid. (Box No., 1s. extra.)

A.A.A.A.—MANAGER (39); disengaged; over 20 years' experience; London and Suburbs; business-builder; thorough knowledge all branches. "Chemist," 30 Lorne Gardens, Park Road, N.W.8.

A.A.A.—MANAGER (31), Qualified; married; excellent all-round experience in London and Provinces; London or near; free one month. "Chemist," 65 Leyborne Avenue, Ealing. 'Phone: Ealing 2608.

A.A.A.—PHARMACIST (36), good business man, experienced all branches, seeks responsible post; judicious Buyer, keen Salesman; wide experience. 29 High Street, Hampstead, N.W.3.

A.A.A.—QUALIFIED Scot (26), of smart appearance and address, at present Managing large High-class Chemist and Photographic Business in residential London suburb, desires change with good prospects for conscientious worker; first-class references; interview arranged. 219/2, Office of this Paper.

A.A.A.—QUALIFIED (27), single, requires temporary or permanent position in London; experienced and capable; smart personality; highest references; free January 25. Green, 2 Troutbeck Road, New Cross Gate, S.E.14.

A.A.—PHARMACIST (35), Qualified, desires progressive post; London only; Company and Private experience; free at short notice; interview. "Chemist," 46 Clapham Road, Stockwell, S.W.9.

A QUALIFIED Man (29) with wide experience, single, well educated, seeks post; free end of month. "Chemist," 5 Bainton Road, Oxford.

A WEST-END (or vicinity) evening position required by experienced Qualified man (30); references. "Chemist," 81 Walm Lane, N.W.2.

ADVERTISER, capable M.P.S., F.B.O.A. (59), keen, modern ideas, good Refractionist, moderate salary, seeks Management. "Spes," 29 Ipswich Street, Stowmarket.

AN experienced Qualified Man (29), single, of good education, wants post in London. 221/9, Office of this Paper.

AN Unqualified Assistant, young, willing worker; Windows, Counter, Dispensing; free immediately; London, S.E. or S.W., preferred. Advertiser, 263 Court Road, S.E.9. 'Phone: Eltham 2442 for interview.

ASSISTANT Lady Dispenser seeks post, part or full time; Hall certificate; experienced; Brighton or easy distance. 8 Prestonville Road, Brighton.

ASSISTANT (26), Part I; part or full time; Manchester or Stockport area; high-class Dispenser, Counter and Window-dresser. "F.," 76 Acre Lane, Bramhall, Cheshire.

ASSISTANT (27), Unqualified; all-round experience Dispensing, Counter, Window-dressing; London preferred. "Advertiser," 44 Turneville Road, W.14.

BIRMINGHAM DISTRICT.—Whole or part time; permanent or temporary; exceptional experience; interview. "Cascara," 41 Grantham Road, Sparkbrook, Birmingham.

CAPABLE Assistant, tall, active, abstainer, good appearance; first-class experience Dispensing, Sales and general routine; 15 years last refereuce; permanency required; please state salary; residing West of England. 220/1, Office of this Paper.

CHEMIST, experienced, excellent Prescriber, disengaged, desires management; locum; London or Provinces; reasonable salary. "Chemist," 46 Buckley Road, Brondesbury, N.W.6.

CHEMIST-OPTICIAN, M.P.S., F.B.O.A., J.C.Q.O., 20 years managing, desires change, permanency; excellent Windows, Photography, clever Prescriber, successful Refractionist; own Optical equipment; excellent references. 41 Woodlands Road, Isleworth.

CHEMIST (35; 6 ft.) knowledge Animal Diseases, Veterinary Therapeutics, Agricultural Pharmacy, desires appointment. 221/10, Office of this Paper.

CHIROPODIST (lady), clinic-trained Masseur, Electrical and Orthopædic experience, requires post in or near London; salary and commission. Apply Douch, Chemist, Throgmorton Street, E.C.2.

DISPENSER (Hall), experienced, Doctor's daughter, desires re-engagement, Doctor or Hospital; locums considered. Tomlinson, 18A Mount Street, Diss, Norfolk.

DOES anyone require services of young Registered Pharmacist?—Locum or permanency; 11 years' Retail and Hospital experience; highest references. H. E. Gauld, 139 Petherton Road, N.5.

EXPERIENCED Assistant (45), tall, Unregistered; courteous and tactful Salesman; quick and careful Dispenser; Photo, Windows, Agricultural; well recommended; permanency or locum; disengaged. Haigh, 34 Bulwer Street, Shepherd's Bush, W.12.

EXPERIENCED Manager, used to control and high-class West-End business, seeks responsible position; shortly disengaged. "M.P.S.," 12 Cunningham Place, N.W.8.

JAMES LEES, M.P.S., Beechwood, New Cumnock, Ayrshire, experienced locum; England or Scotland; free for Relief or Emergency.

JUNIOR Female Assistant (22); four years' general experience; moderate salary; S.W. London preferred. C., 70 Chestnut Road, S.W.20.

LADY, "Hall"; excellent experience in all departments; able to take charge; highest references. 220/19, Office of this Paper.

LADY Pharmacist requires post, 4 days weekly or locum; thorough general experience; free now. "Chemist," 220 Portsdown Road, W.9.

M.P.S. (25) requires situation; London or South preferred; all-round experience; keen Salesman. 219/25, Office of this Paper.

PART-TIME Assistant, Saturday, Sunday only (22); 5 years' experience Counter, Window Display, Dispensing, Veterinary; West London preferred. Pharmico, 25 Kingsley Avenue, Southall, Middlesex.

QUALIFIED; elderly; locum or permanent. "W. T.," c/o Novis, Ltd., 406 Caledonian Road, N.7. 'Phone: North 2847.

QUALIFIED Lady, experienced, reliable, desires change, Manager or Assistant; near Crosby or Chester. Chemist, 51 Kingswood Drive, Gt. Crosby, Liverpool.

QUALIFIED (25) desires change; at present Managing branch; London preferred, but not essential; excellent references; free one month. 220/29, Office of this Paper.

QUALIFIED (25), of good address, experience all branches, seeks position of further responsibility in high-class Pharmacy; excellent references. 220/46, Office of this Paper.

QUALIFIED (30); Manager or Senior; varied London and Provincial experience; South or South-Western Counties preferred; free now. 219/12, Office of this Paper.

REFERRED Part II (age 24), smart appearance, requires situation in Pharmacy or Hospital, preferably Midlands or South; disengaged; good all-round experience. Jefferies, 50 Shakespeare Street, Coventry.

REFERRED Part II (Pharmacognosy) requires locum or permanency; free immediately; please state salary offered. D. S. Benton, Bury, Huntingdon.

UNQUALIFIED desires change, London or Suburbs; London and country experience; good Window-dresser and accurate Dispenser; free shortly. H. Waterman, 29 Fairfield Road, Chelmsford, Essex.

UNQUALIFIED Manager (21); all-round experience, requires change; outside or inside; 100 per cent. takings increase since taking present post; anywhere, at home or abroad. Apply, 218/9, Office of this Paper.

UNQUALIFIED, married (36), seeks permanency; 7½ years present position; good all-round; Counter, Window-dressing, Dispensing; able to take charge. Over, 26 Boscombe Road, W.12.

UNQUALIFIED, referred Forensic, requires post, temporary or permanent; general good-class experience; free immediately. 14 Conway Road, Southgate, N.14.

UNQUALIFIED (46) desires permanency in Country Pharmacy where hours are not too long; experienced and conscientious worker; good references; moderate salary. 219/18, Office of this Paper.

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Printed in Great Britain for the Proprietors by EYRE AND SPOTTISWOODE LIMITED, His Majesty's Printers, East Harding Street, London, E.C.4, and Published by the Proprietors, MORGAN BROTHERS (Publishers), Limited, at 28 Essex Street, Strand, London, W.C.2.—*January* 23, 1937. [1½]